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REFERENCES AND ABBREVIATIONS

Readers in search of a given subject will find it useful to bear in mind that the references are in several cases distributed under two or more separate but nearly synonymous headings—such, for instance, as Brain and Cerebral, Heart and Cardiac, Liver and Hepatic, Child and Infant, Goitre and Thyroid, Diabetes, Glycosuria and Sugar, Eye, Ophthalmic, and Vision, Lunacy and Mental Disease, Arsenobenzol and Salvarsan, &c., &c., and that regional headings are more frequently used than pathological. Institutions and Corporations with the right to the prefix Royal will be found under that prefix, with the exception of Hospitals, which will be found under that heading; and Medical Societies, which are separately indexed under Societies. All Universities are indexed under the word University. (A.) = Annotation, (C.) = Correspondence, (N.I.) = New Inventions, (L.A.) = Leading Article, (M.L.) = Medico-legal, (M.T.T.) = Modern Technique in Treatment, (O.) = Obituary, (P.I.) = Parliamentary Intelligence, (R.) = Review, (R. and A.R.) = Reports and Analytical Records, (A.D.) = Clinical Interpretation of Aids to Diagnosis, and (N.P.) = New Preparations.

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Chadwick Lectures

ON THE

HISTORY OF EPIDEMIOLOGY

DURING THE LAST HUNDRED YEARS.*

BY SIR WILLIAM HEATON HAMER,
M.D. CAMB., F.R.C.P. LOND.

LECTURE II.

THE sage, Koheleth, "the Preacher," who lived more than 2000 years ago, said there was "no new thing under the sun." The thought is that of the "Persistence in Change" (Dauer im Wechsel) of Goethe, who elsewhere says "Everything that is wise has been thought already; we can only try to think it once more."

Some have surmised that Koheleth was a physician, and certain passages in the book of Ecclesiastes support this view, and have been said to foreshadow the first Aphorism of Hippocrates, or even Sydenham's doctrine that "Epidemics succeed each other regularly and in series forming as it were a circle." A verse much commented upon runs: "He hath made every thing beautiful in his time: also he hath set the world in their heart, so that no man can find out the work that God maketh from the beginning to the end." It is said that the word translated "world" should be rendered "eternity" (or "history"), and such renderings prompt the suggestion that Koheleth was a bit of an epidemiologist: he would then have realised the limitations of his own "little patch of immediacy," and have proceeded as Prof. Whitehead says we must do, to apply the experience gleaned from that patch to the teaching of bygone times.

Be this as it may, the history of epidemiology is replete with illustrations of such lines of thought.

Thus it has been suggested that one of the most characteristic marks of pandemic influenza is that it is generally acclaimed by mankind as a "new disease," and then, as Dr. Goodall says, and there is no greater living authority on such a point, "there is no such thing as a new infectious disease." The occurrences of 1915–25 almost seem to justify the application to influenza of Alphonse Karr's phrase, "Plus ça change, plus c'est la même chose," and to support Hirsch's somewhat paradoxical declaration that "Influenza, beyond all other acute infective diseases, has manifested at all times and in all places the stamp of uniformity in the aggregate of symptoms." Dr. Charles Creighton's History prompts similar lines of inquiry. The accounts of the "Sweating Sickness," of "Gaol Fevers, Influenzas and other Fevers of the Tudor Period," the great chapters on "Typhus and other Continued Fevers" and "Fevers and Dysentery in Ireland," leading up to "Influenza and Epidemic Agues," in which we are told "Epidemic Agues are joined in the same Chapter with Influenzas for the reason that they can hardly be separated from them in the earlier part of the history," this stirring argument was set out by an historian steeped in the medical learning of the earlier centuries, familiar with the life-work of Sydenham, Willis, and their contemporaries, and with that of the school founded by them, and was critically and appreciatively expounded in relation with the "influenzas," which had appeared under that name, upon the stage of history during subsequent years. Creighton's facts and speculations stirred the minds of his readers between 1894 and 1915, and made them more apt to receive the impressions hammered upon them during the then succeeding years.

Already in the early 'nineties Franklin Parsons laid stress upon the types (pulmonary, cerebro-spinal, and gastro-intestinal) of influenzal prevalences. Moreover, Leichtenstern urged then that "Influenza presents at least two phases, one pandemic and the other endemic, and they follow different epidemiologic rules"; he further expressed two beliefs—first, that "trailing epidemics show diminished morbidity, less wide geographical distribution, scarcely recognisable communicability, slow development and extension, and continuous diminution in frequency and intensity"; and, second, that "in the later epidemics the *vis morbi* became more pronounced with the decrease of the *vis contagii*, owing perhaps to weakened influenza germs entering into closer symbiosis with other pathogenic organisms."

Again, Dr. Goodhart declared in the middle of the 'nineties "influenza is still with us," and it was becoming recognised that in family attacks of influenza the disease was apt to be quite differently manifested in the several sufferers, and, if this was accepted as regarded households, why, it was being asked, was it not credible as regards communities also?

In East Herts, in 1904–5, Dunn and Gordon described their "obscure disease simulating influenza"; then came the cerebro-spinal fevers of Glasgow and Belfast, the poliomyelitis reported upon by Broström in Sweden and by Farrar and Reece in this country, and that of New York in 1916. In London Shirley Murphy more than 20 years ago secured the notification of cerebro-spinal fever and soon afterwards of poliomyelitis and polio-encephalitis, and borough medical officers made careful study of each case notified. As early as Jan. 27th, 1912, it was possible to assure Dr. Reece that cerebro-spinal fever and poliomyelitis were distinguishable, one from the other, by reason of the fact that the record of the former appeared on blue forms and that of the latter on white forms. In the London Annual Reports for 1914–17 account of the behaviour of these two epidemic diseases was given, and in 1915 study of the close relationship between cerebro-spinal fever and influenza in London was made.

Then came the prevalences of 1918, and early in that year it was apparent that "The events of the last few months once more strikingly illustrate the 'posting character,' the unexpected manifestations and the protean behaviour of 'influenza'; and, incidentally, the close connexion between polio-encephalitis (i.e., what has since been called encephalitis lethargica), poliomyelitis and cerebro-spinal meningitis, and influenza, seems to be established." (Annual Report for 1917, p. 2.)

In the Ministry of Health Report of 1920 Sir George Newman gave (p. 16) an account of "our growing experience of the setting of an influenza epidemic"; and the same report sets out in detail the experiences of John Huxham between 1728 and 1752, and presents a summary record (p. 17 and onwards) of similar phenomena collected by various observers, from Sydenham's time down to 1847.

Study of the epidemiological record, then, makes it clear that, so far as the influenzal group of diseases is concerned, the natural history method, the method of Hippocrates, is that which must primarily be relied upon.

Dr. Adams tells us that it is very difficult to assign the cases described in the first book of the Epidemics of Hippocrates to their appropriate disease categories. The reason, he says, is that they are "directly drawn from Nature." Sydenham followed this method, and Dr. Payne not many years ago remarked that it is sometimes impossible to decide as to the nature of the prevalences he is discussing. Nowadays we are very prone to think in terms of "causal organisms" (as we used to call them; they are really many of them just "associated organisms"), whereas Sydenham and his followers unravelled the relationships between *associated prevalences of epidemic diseases*, and we are beginning to realise that it behoves us, too, to think in epidemics as well as in micro-organisms.

The outcome of all this may be best appreciated by focusing attention upon Sydenham's treatment of the difficulties with regard to influenza; but it must be a reversion to Sydenham's matured views, not merely to the tentative and, as would now appear, somewhat prematurely conceived doctrines enunciated in those wonderful opening chapters of his Medical Observations.

This first draft, so to speak, underwent in Sydenham's own mind a considerable amount of revision; the original sketch was, however, incorporated in a revised edition in 1675, and, achieving in this form, as it soon did, a world-wide reputation, has not unnaturally been commonly regarded as representing his final view; examination of the development of the conceptions revealed in the writings of the older Sydenham will, however, show that this was very far from being the case. Already in 1675 (Med. Obs. V., vi. 6) it appears he was beginning to concern himself with what now seems a somewhat meticulous enumeration of differentiæ between the "stationary fevers" of his earlier constitutions, and, even at that date (V., v. 1–3, and V., vi. 1–2) he noted the resemblance of his first stationary fever to the fever of the winter of 1675, to which, and to the successors of which, he makes fuller reference in the letter to Dr. Brady of 1680 (paras. 54–57). He speaks of it as the "depuratory fever," the "standard fever of Nature," the "fever upon which Hippocrates and other great physicians of antiquity have commented."

One never need feel surprise at coming across some new light in studying Sydenham, and it is not to be wondered at, therefore, that a pearl of great price is to be found hidden in what is at first sight a somewhat unpromising Postscript to his "Tractate on Dropsy" written in 1683; here, after two and a half centuries, we can still glimpse one of his flashes of inspiration.

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* Being two lectures delivered in London under the Chadwick Trust on Feb. 16th and 23rd, 1928. Lecture I. appeared in THE LANCET last week.

It relates to an epidemic following after that intriguing fever of 1675 already alluded to above. He has pondered over this and its successors with special fondness, and now he encounters the prevalence of 1679 which has been hailed by modern epidemiologists as an influenza trailer. This led him formally to abandon the impression he had at first entertained that the fever of 1679 was something new. He says it must be reckoned as a common "intercurrent," and he styles it the "winter fever"; then later still (Sched. Mon., 1, 4) he explains that, while at first disposed to regard this "winter fever" as just an "intercurrent"—i.e., as "a bastard peripneumony which occurs in all winters alike," he now realises that it is entitled to rank as a stationary fever; he proceeds, therefore, to execute a full-length portrait of it (Sched. Mon., 1), and there it stands, an unmistakable example of a cerebro-spinal influenza of the seventeenth century, of which the London cerebro-spinal fever of 1915 was, as was claimed at the Royal Society of Medicine at the time, an indubitable lineal descendant. In the final paragraph of Sydenham's account (loc. cit., 46) he has another inspiration, for he says of this stationary fever, "It may be a spirituous and subtle beginning of something else, the germ perhaps of the depuratory fever now exploded, but which the plague followed." Of course, as we now know, it was the precursor of the influenza of 1688, just as the London cerebro-spinal fever of 1915 was the precursor of the great influenza of 1918.

The new light afforded by demonstration of the relationship of this fever of 1685 to the succeeding influenza, and especially the clear recognition, which has just been noted, by Sydenham of the possibility, nay likelihood, that this 1685 fever was identical with the stationary fever ("depuratory fever") of 1661–64, in which he had been so greatly interested nearly a quarter of a century previously, enable us step by step to trace the development of his maturing view that the standard fever of 1661–64, that of the winter of 1675, the depuratory fever, the "winter fever" of the Postscript of 1683 above referred to, the fever of 1685, and we must now add the influenza of 1688 (though that was the year of Sydenham's death), were all phases of one abiding influence. There is here, in fact, the germ of that modern conception "endemic influenza."

In recent discussions regarding Sydenham's Constitutions at the Royal Society of Medicine, while there has been some difference of opinion on the general questions at issue, there has been practical unanimity concerning the special application of his thesis to epidemic prevalences associated with influenza. It may be of interest, therefore, briefly to indicate the extent to which twentieth century findings concerning the influenzal constitution were adumbrated by Sydenham.

In the first place, Sydenham's account of his fifth constitution, that of part of the year 1673 and of the whole years 1674 and 1675, is now recognisable as the classical description of an influenzal constitution. It comprehends a widespread influenza occurring (to use Sydenham's terminology) in a setting of "comatose fevers." This series of prevalences quite plainly furnishes the almost exact counterpart to the great influenzas of 1918 with their precursors and trailers. Thus, following upon comatose fevers in 1673 and 1674, we are told, the fever of 1675 "spread its ravages far and wide" in July (exactly, it may be noted, in passing, as it did in 1918); the attack was first upon the bowels and then the head, the fever, however, "having the predominance and taking the lead of the other maladies of the year." The notion was entertained by some, says Sydenham, that the complicating "dysentery and diarrhœa which did so much mischief arose from these two diseases; whereas in reality they were to be imputed to the fever" (i.e., to influenza). "Everyone, however, who had any practice among the sick, knew the predominance of the fever and knew also that the aforesaid dysentery and diarrhœa were symptoms rather than essential and primary diseases." (Med. Obs., V., i., 5; see also V., ii., 23.) "This was the course which was held by the fever throughout the autumn, sometimes it attacked the head, sometimes the bowels. It everywhere put on the symptoms of the particular part affected." At the end of October the weather "suddenly changed to wet and cold. This brought on coughs and catarrhs, which" (says Sydenham) "were more numerous than ever I remember them to have been," and upon these "supervened the stationary fever of the year (as in October–November, 1918), and this, having once taken its hold, increased, and varied in some of its symptoms from the fever of the previous part of the year" (attacking, however, now the lungs and pleura instead of the head and bowels). At the end of November the catarrhs and coughs suddenly decreased. "The fever, however, remained as before, just as it was before the catarrhs" (V., i., 7). "All that suffered, suffered first in the head, back, and limbs; these being the symptoms" (of the influenza, as we should say, but keeping Sydenham's wording it reads) "which were most constant to the non-pleuritic fevers, which preceded and which characterised them to their close." (VI., i., 6.)

Sydenham's description is unmatchable for vision, precision, and terseness of expression; moreover, he explicitly reiterates, again and again, that while the bowels, brain, and lungs were successively attacked, the accompanying diarrhœa, stupor, and pneumonia were all merely symptomatic of one stationary fever, and the characteristic marks of that fever he stamps most unmistakably upon it.

In the second place, it is clear that the pulmonary trailer of 1679 riveted Sydenham's attention upon the special type of prevalence with which the influenzas of "the 'nineties" made Western Europe so familiar; after much study and reflection he concluded that the said fever recurring winter after winter was identifiable *not only* with the fever of 1685 (see R.S.M., loc. cit. 1915) and thus heralded in that "spirituous and subtle something" (the influenza of 1688), but was also identifiable with the "depuratory fever," which had accompanied and been found to be interchangeable with the "intermittents" of 1661–64 (i.e., with the gastro-intestinal, pulmonary, and nervous trailing epidemics) following the great influenza of 1658.

Then, thirdly, we have Sydenham's statement (M.O., V., vi., 2) regarding the interchangeability of the intermittents and the stationary fevers, which "ran parallel with them"; and he formulates the thesis (letter to Dr. Brady, para. 56) that in intermittents "Nature works hastily and gets over in less time than is regular the processes by which she first tempers and afterwards discharges the morbific matter." "Depuratory fevers," he adds, "are different; 13 or 14 days elapse before the appearance of any signs of the concoction of the febrile matter, which is then to be ejected by sweats; or rather by a somewhat free transpiration." Again, in para. 57, he contrasts the later "humoral or earthy fevers, which cleared the blood but slowly," with the earlier fevers of the same constitution, "which were subtle in principle, intermittent in type and did their work more rapidly."

Elsewhere[1] the application to the study of the influenza wave of this mutation theory of Sydenham has been discussed; to use modern phrasing, he is contending that the virus of influenza works more easily and rapidly near the crests of the pandemics and with more difficulty and more slowly in the intervening troughs.

Furthermore, there may also be deduced from Sydenham's own writings the conclusion that between the widespread prevalences on the crests of the great pandemic influenza waves and the depuratory fevers (or endemic influenzas) of the troughs, ripples of intermittents appear, both on the ascending and descending slopes of the great ocean rollers. Sydenham, as is well known, identified the intermittents of 1675–79 (following the great influenza of 1675) with those of 1661–64 (following the great influenza of 1658); but he also makes it clear (IV., i., 5 and 6) that similar intermittents preceded both the influenza of 1675 and that of 1688 (Sched. Mon. I., 46).

Let us recall his statement made in 1675 (I., ii., 21–23):

> "I may state at once, that to reduce into classes all the species of epidemics, to arrange them according to their phenomena, to work out their several idiopathic characteristics, to determine in detail the proper method of treatment for each of them is a work so difficult, an arrangement requiring so much leisure and opportunity, a cycle so little coincident with any recognised sequence of years, that the lifetime of no single physician would suffice for the collection of a sufficiency of data." But he was better than his word, for we find him later adding material contributions to what (in 1675) he had described as "My mite, such as it is, towards the foundation of a work, that in my humble judgment shall be beneficial to the human race."

As so much has been said and thought recently concerning influenza, it may be of interest to refer to a question forced into prominence of late years, that of the damage inflicted by that disease upon the nervous system. The relation of cycles of genius to prevalences of influenza was recently undertaken with a view to ascertaining whether "influenza years" were years in which such damage especially resulted. In the first instance the attempt had been made to obtain confirmation of the suspicion that influenza plays a part in the causation of insanity. The records of insanity, however, are of such recent date, and are so beset with fallacies, as to make this task an exceedingly difficult one; it seemed then to be a more practicable plan to begin, as it were, at the other end—i.e., with men of genius, and to try to ascertain whether the extent to which their nervous systems are damaged by influenza can be gauged with any approach to accuracy.

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[1] Proc. Roy. Soc. Med., 1927, xx., Epidem. Sect., 69–61.

At first sight it was surmised that the influence, if any, might be expected to be most conspicuously revealed at the age of special intellectual development and of main output of mental work, say at 25–50. On further consideration it was decided to examine in like manner a corresponding graph for the earlier age-period 0–25. Later still it seemed desirable that the graph for ages 50–75 should also be constructed. The three graphs present some resemblances and some noteworthy contrasts.

As they relate to the same lives at different age-periods—in youth, in early and in later maturity, respectively—it is obvious that the three contours will show a considerable degree of resemblance. On examining the special effect of groups of "influenzal years" it is at once apparent that they operate prejudicially in all three graphs, but their evil influence is most discernible in the 0–25 graph.

The marked influenza periods of the last three centuries—1657–93, 1708–18, 1729–43, 1757–67, 1780–90, 1798–1807, 1824–37, 1842–51, 1857–64, 1890–95, and 1915–25, were scrutinised seriatim to ascertain the depth of the depression produced at these times in the outlines of the graphs for 0–25, 25–50, and 50–75 years of age respectively. In the case of each depression an *index* was obtained representing the proportion of loss per number of lives at risk for each group of influenzal years. This index was found to vary from practically *nil* in three instances to the *highest limit* of approximately one-half.

The question at once rises whether on the average these indices approximate to what might have been expected a priori in dealing with *any* epidemic disease causing mortality in the population at large and incidentally influencing the output of work by men of genius?

In the first place, no epidemic disease of which precise statistics are available causes such ravages as are shown in these graphs relating to the influenzal group of diseases. Limiting consideration, then, to that group, the greatest recorded rates of mortality for the population as a whole was that of 1918. The total London loss from influenza in that year was about 18,000, rather more than one-fifth of the total deaths registered. So high an "index" as this was not forthcoming in any earlier group of years, though the *proportion of total deaths to population* was equally high in two individual years of special influenza prevalence during the middle third of the eighteenth century. The average index, taken over the whole of the prevalences of the last 250 years, was clearly very much less than one-fifth.

It is hence apparent that the influenzal group of epidemics leave their impress to a quite excessive extent upon men of marked ability as compared with the population as a whole.

It was, in bygone times, almost a commonplace that sweat, influenza, and "volatile typhus" affected "gens aisés," "people of the court," and the "noblesse," in contradistinction to other epidemics which specially attacked the poor, badly housed, and ill-nourished.

One reason for this excessive class incidence may have been that those who used their heads were more liable to suffer than those who used their hands. We must, in fact, be prepared to accept the conclusion that the widespread prevalences of influenza during the last two and a half centuries have levied a specially heavy toll upon men of marked ability; and in some conspicuous instances the facts are on record that the influenzas of past times again and again attacked notable men and women. Chopin, Sterne, Swift, Jane Welsh Carlyle, and William James may be referred to as instances of this, and for the abrupt termination of the lives of many remarkable men (from Shakspere and Cromwell onwards) influenza was presumably responsible.

The critic may urge that, while appreciating that something may be said for approaching the study of epidemiology from the "big endian," as opposed to the "little endian," point of view, he would like to know whether it is likely that anything of *practical* value will result from adopting this method of approach, say, for example, in the case of influenza. Certain conclusions may at any rate be drawn. Influenza is, as Noah Webster said years ago, the "crux of epidemiology." It is not merely, as it was long supposed to be, a "pandemic disease" reappearing once or twice in a generation, but it is ever present, now smouldering and then every 10, 15, or 20 years, bursting into flame. Its great prevalences are especially favoured by war, famine, overcrowding, and free communication with sufferers from the disease in the early stages of their illness. Despite, however, the huge increase of means of intercommunication and traffic during the last 100 years, coupled with entire absence of systematic attempts to limit spread of the disease by sufferers in the early stages of illness, the mortality in London from the influenzal group of diseases appears not to be appreciably greater in proportion to population than it was 150 years ago. The influences that have made for good have been improved feeding, better housing, greater cleanliness, and provision of medical and nursing care in serious cases; but now while continuing to develop resistance on these lines, there *should be added*, thereto, carefully considered measures for preventing sufferers from mixing freely with their fellows in offices, schools, conveyances, and places of assembly, as they do at present while in the early highly infectious stages of illness; above all, it must be appreciated that the most extravagant and bizarre efforts made, under the influence of panic, at times of widespread prevalence, are as nothing compared with steady and continued prosecution of a considered campaign against the influenzal group of diseases, conducted on epidemiological lines.

The conclusion from a survey of the last century of epidemiology would then appear to be that already reached by a number of Chadwick lecturers. It was first stated, however, by Sir William Collins, in a form in which it is particularly applicable to epidemiology in an address on "Physic and Metaphysic," delivered to the Abernethian Society on Feb. 16th, 1905. Sir William, quoting Dr. Martineau, says:—

> "Laplace, in scanning the heavens with his telescope, could find no God, and Lawrence declared that the scalpel in dissecting the brain came upon no soul. Both are unquestionably true, and it is precisely the truth of the second that vitiates the intended inferences from the first. Had the scalpel alighted on some perceptible soul we might have required of the telescope to perform a similar task; and on its bringing in a dumb report have concluded that there was *only mechanism there*. But in spite of the knife's failure, we positively know that conscious thought and will *were* present, yet no more visible yesterday; and so that the telescope misses all but the bodies of the universe and their light avails nothing to prove the absence of a living mind through all. If you have the wrong instrument the objects of your search may well evade you. The test-tube will not detect an insincerity or the microscope analyse a grief."

This question of instruments assumes nowadays very great importance in connexion with epidemic disease, for epidemiologists using field implements sometimes glean very different conclusions from those deduced by bacteriologists employing laboratory implements. As an example "food poisoning" may be referred to. The epidemiological evidence has gradually accumulated during the last three and a half centuries. Dr. J. J. Walsh (International Congress of Medicine, 1913) carries us back to the food poisonings of the Middle Ages, which, he says, were in the main cases of illness (often apparently of infectious illness) with obscure abdominal or cerebro-spinal symptoms; and thus the characters of those supposed "pitiless poisoners," the Borgias, were taken away owing in part presumably to unrecognised prevalences of gastro-intestinal and cerebro-spinal influenza. Ozanam also testifies that epidemic encephalitis was often regarded as due to poisoned food. Crookshank has carefully set out the evidence for acceptance, as cerebro-spinal influenza, of much of the "convulsive ergotism" of past centuries. Even as recently as 1888 we find the

Middlesbrough outbreak of pneumonia ascribed to food. Lichtenstern, however, spoke confidently of "influenza dinners" in the early 'nineties, and Bulstrode's report on the Greenwich outbreak of 1893 was typical of many others in which influenza and not food was presumably at fault.

But the whirligig of time brings in its revenges and many supposed food outbreaks of the 'nineties were studied exclusively from the bacteriological point of view; again, during the recent influenzas, botulism ran riot in the Western States of America and both here and on the continent large numbers of reports on food outbreaks appeared, in which "causal organisms" (complying with appropriate serological tests) were described and exhaustively studied, from many points of view, but not from that of possible association with the prevailing epidemic. In a recent report[2] mention, however, is made of a "considerable number of cases which are ascribed, often very confidently, to food poisoning without any justification." Moreover, we learn that "Medical officers and others have sometimes limited their interest and activity to tracing the outbreak to some given article of food" . . . while "the more distant sources have been left untraced"; even in the report in question, oddly enough, no mention is made of influenza, though the survey relates to outbreaks occurring during years of widespread prevalence of that disease.

The records of these recent years, in fact, abundantly bear witness to the need that field observations and field research should have place as well as laboratory observations and laboratory research, the two sets of findings being placed alongside one another and coördinated together. Given such a consummation, it may be surmised that, in public health, as in other scientific work, an "Age of Professionalism and Specialism" will slowly but surely give place to an age in which interest will be taken in general principles as well as in stubborn and irreducible facts. This is the lesson, which he who runs may read, in the history of epidemiology during the last hundred years.

THE INTENSIVE SERUM TREATMENT OF SEVERE DIPHTHERIA.

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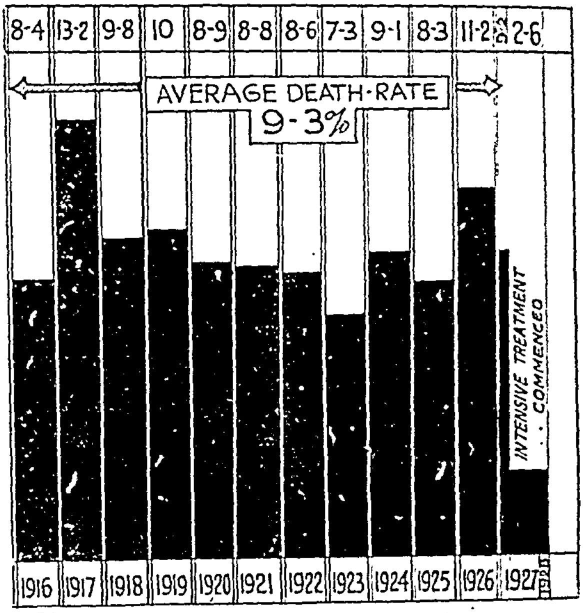
This article contains preliminary observations upon the treatment of severe diphtheria by large doses of antitoxin, administered chiefly by the intravenous route. This has been a routine measure for over a year in the City of Leicester Isolation Hospital and, although the period is short, the results justify this report. Perhaps the most striking feature is the reduction in the hospital death-rate from diphtheria. The average death-rate calculated upon all completed cases—i.e., those discharged or died—during the 11 years 1916–26 was 9·3 per cent., the lowest mortality in any year being 7·3 per cent., and the highest 13·2 per cent. The new method was adopted on April 1st, 1927, and during the succeeding period of 12 months—i.e., to March 31st, 1928—the death-rate was 2·6 per cent. Excluding laryngeal cases and patients dying within 12 hours of admission, the death-rate was 1·7 per cent. The chart shows the reduction.

The 300 verified cases dealt with during the period included no less than 27 malignant or severely toxic cases of diphtheria (Group A), most of whom, according to our former experience, would have died under the older method of treatment whereas, under the new conditions, only six died. The very toxic cases amounted to 9 per cent. of the total, and this figure approximately corresponds with the average death-rate for past years. On the other hand, the number of laryngeal cases was exceptionally low during the period, and this fact would tend to keep the death-rate low. Nevertheless, we are convinced that the reduction actually effected in the mortality was chiefly due to the number of severe toxic cases which recovered under the intensive method of antitoxin treatment.

Death-rate (per cent.)—



Years—

Chart showing the percentage mortality of cases of diphtheria treated at the Leicester Isolation Hospital from 1916–28.

Classification of the Cases.

During the year 326 cases were discharged from, or died in, the diphtheria wards, and of these 26 were proved to be not suffering from diphtheria and have been excluded. Of the 300 verified and completed cases, seven were infants with laryngeal diphtheria. The remaining 293 cases have been classified for convenience into three groups, according to the extent of the local manifestations and the degree of toxæmia. Following out the five points of the scheme detailed below and knowing the subsequent history, we have had little difficulty in assigning each case to its appropriate group. The classification cannot always be made with certainty when the case is first admitted, but is generally easy after a few days.

Group A (malignant or severely toxic) comprised 27 cases having the following five outstanding clinical features:—

(1) *Extensive diphtheritic membrane* involving fauces, tonsils, uvula, soft palate, and naso-pharynx. In some the membrane extended over the hard palate even to the teeth and in others covered the nasal mucous membrane. Towards the spreading margin the membrane usually presented a semi-transparent glistening appearance with an ill-defined edge; these characteristics usually signify a rapid spread. Œdema of the fauces adds to the gravity of the case.

(2) *Cervical adenitis and peri-adenitis* of severe degree, the swelling in the neck having the typical rounded contour. The condition varied from the extreme "bull-neck" type with enormous uniform swelling all round the neck to the type which might almost be described as unilateral. In no case was the size of the swelling less than that of a hen's egg.

(3) Nasal discharge generally profuse, sometimes hæmorrhagic, very rarely scanty.

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[2] Med. Research Rep., 1925, No. 92.

(4) Fœtid odour from the throat, typical of severe diphtheria.

(5) Toxæmia of severe degree characterised, inter alia, by delirium, stupor, and coma in the worst cases, and by great lethargy and hebetude in the others.

Group B (moderately toxic), consisted of 52 cases having the above features, modified as follows:—

(1) Extent of membrane: the tonsils, one of both pillars of fauces, and a small area of soft palate or naso-pharynx covered.

(2) Cervical adenopathy: the cervical glands enlarged to about the size of a walnut and with some degree of peri-adenitis.

(3) Nasal discharge: scanty or absent.

(4) Fœtor from throat: generally nil; sometimes could be detected.

(5) Evidence of toxæmia: the quiet, subdued demeanour of diphtheria, but with mental alertness.

Group C (moderate and mild) comprised the great bulk of the cases (214 in number) and had the following features:—

(1) Extent of membrane: not spreading further than the pillars of the fauces.

(2) Cervical adenopathy: enlarged glands palpable in most cases but not visible.

(3) Nasal discharge: scanty or nil.

(4) Fœtor from throat: generally nil; sometimes could be detected.

(5) Evidence of toxæmia: the quiet, subdued demeanour of diphtheria, but with mental alertness.

Dosage of Antitoxin Employed.

All cases deemed on admission to belong to Group A had antitoxin administered both intravenously and intramuscularly in doses varying from 70,000 to 200,000 units. Generally the dose given on admission was about 50,000 units intravenously and 20,000 intramuscularly. In a few of the worst cases doses up to double these amounts were given on admission. Where there seemed to be an insufficient response in about 12 hours' time a second dose was given. The chief indications for a second dose were: (1) The local condition: the membrane should have begun to become opaque with well-defined raised margins, showing that spread had ceased; the cervical swelling should have become correspondingly reduced. (2) The general condition: the patient should have become appreciably brighter and more alert, showing a diminution of the toxæmia. The latter point is the test par excellence of the adequacy of dosage in the severe toxic cases of diphtheria. If there is no improvement or inconsiderable improvement in the dull stuporous mental condition, then a second large dose of serum intravenously is most certainly indicated. More serum was given 24 and 36 hours after admission if there were insufficient signs of arrest of the disease or of the toxæmia. The average dose of serum actually given in the 27 cases of this group was 71,000 units intravenously and 31,000 units intramuscularly.

In Group B the first dose was generally about 20,000 units intravenously and 8000 to 16,000 intramuscularly. Occasionally a second dose was required. The average dose for the 52 cases of Group B worked out at 19,000 units intravenously and 19,000 units intramuscularly. In Group C no departure was made from the well-recognised dosage for moderate and mild diphtheria—viz., 8000–16,000 units intramuscularly. The average dose in this group worked out at the rather high figure of 14,000 units. This was due, no doubt, to some excess of caution where it was doubtful on admission whether the case should be classified in Group B or Group C.

Technique.

The technique of intravenous injection of large amounts of serum in young children does not, as a rule, present much difficulty after some practice. It takes time, however, and one of more assistants are generally necessary.

The vein of choice is the median basilic at the bend of the elbow, and if failure is encountered here in both arms a superficial vein in front of the ankle-joint or over the dorsum of the foot is explored. In the youngest infants the finest hypodermic needle, and in older children a medium or large bore hypodermic needle is employed. The serum is injected directly from 10 c.cm. or 20 c.cm. Record syringes, preferably with eccentric nozzles. The whole amount to be injected is ready at hand in the syringes before the puncture is made. A tourniquet is applied to the upper arm, and one assistant keeps the arm firmly hyperextended by pressing on the triceps area with one hand and on the anterior aspect of the wrist with the other. When the puncture is made it is essential to withdraw a little blood into the syringe before attempting the injection, since otherwise the needle-point may not be lying actually within the vein. The serum is necessarily injected slowly through such a fine needle, and care must be taken to avoid the entry of air-bubbles into the vein. In detaching the syringe from the needle great care is required to avoid dislodging the needle-point from the vein. The second syringe, full of serum, is attached to the needle as soon as a drop of blood appears at the needle-mount. When the requisite amount of serum has been injected the syringe is detached and the needles left in the vein, and our present practice is then to inject 4 to 8 minims of adrenalin intravenously by attaching a hypodermic syringe. Alternatively ½ c.cm. of pituitrin may be injected intramuscularly. The time taken in the whole process of intravenous injection may be as long as 20 minutes in young or fractious children. Very few children offer resistance, since the injection is painless. Indeed, all children prefer intravenous to intramuscular or subcutaneous injection.

The concentration of serum which we have found suitable is about 1400 units per c.cm., but the viscosity, rather than the concentration, is the important point. Serum of higher concentration is exceedingly difficult to push through the bore of a fine hypodermic needle, while a lower concentration involves the injection of a greater amount of foreign protein.

Immediately after the injection the child is covered with warm blankets and packed round with hot-water bottles, and the foot of the bed is raised. In other words, he is treated prophylactically for the rigor and collapse which has occurred in half our patients within half to three hours. The prophylactic administration of intravenous adrenalin, or of intramuscular pituitrin, promises to reduce the incidence and severity of these reactions.

The rationale of intravenous injection of serum is obvious since the maximum concentration of antitoxin in the blood occurs immediately, whereas after intramuscular injection it occurs in 24 hours, and after subcutaneous injection the maximum concentration is not present for three days.[1] Six hours after an intravenous injection of serum there is ten times more antitoxin in the blood than after subcutaneous injection of the same amount, and 24 hours after intravenous injection there is twice as much in the blood as would have entered it by the subcutaneous route.[2] For these reasons, in toxic cases, the major part of the serum required is injected intravenously for immediate effect, and a relatively smaller amount is given intramuscularly at the same time. The position must be reviewed after 12 hours, and further doses given if required.

This method of treatment differs from standard teaching only in the total amount of serum given. Park's view (1921), based on laboratory and statistical evidence, is that "amounts of antitoxin beyond 25,000 units in a child and 50,000 in an adult, are absolutely unnecessary and useless, and that an initial dose of 10,000 units in a child and 20,000 units in an adult is probably sufficient for the whole course of the disease."[3] Goodall states (1928) that in his experience any amount of serum over 30,000 units, even when spread over two or three days, is wasted.[4] Our practical experience of the past year is in direct opposition to these views. Since we commenced this work we have learned with great interest that V. Bie, of Copenhagen, working on similar lines, has been using doses up to 200,000 or even 300,000 units since 1920. We are indebted to him for sending us particulars of his results for the year 1927, from which it appears that in a series of 1456 cases admitted to his hospital the death-rate was 1·3 per cent. These figures exclude laryngeal cases and patients dying within 24 hours of admission. He divides his cases into eight groups, giving the mortality in each group, and states (in a personal communication) that the death-rate in each group and the total death-rate have remained practically unaltered since he began to use the large doses.

Reactions following Intravenous Serum.

In Group A 11 cases out of 27, and in Group B 19 cases out of 37, receiving intravenous serum had an allergic reaction within half to three hours of the injection. The reaction is generally alarming and includes rigor, pallor, prostration, weak pulse, cyanosis about the lips, anxious staring expression, and pyrexia from 104° to 107° F. It lasts, as a rule, only a few minutes, and is followed by sweating and gradual return to the status quo. It is now treated prophylactically. If necessary, adrenalin, up to 2 c.cm. intramuscularly or 1 c.cm. intravenously, may be injected during the attack. Generally 1 c.cm. intramuscularly is sufficient. We have had no fatality from this reaction, nor has Bie in eight years' experience, but he nearly lost one adult, and considered that he saved the patient by injecting 1 c.cm. of adrenalin intravenously after 2 c.cm. intramuscularly had failed to relieve the condition. On account of this experience, Bie does not now give more than 50,000 units intravenously at a time—i.e., 50 c.cm. of the serum which he uses. We have, however, given as much as 140,000 units intravenously in a single dose, with no reaction whatever, while in another case a dose of 8000 units intravenously was followed by a rigor. The reaction seems to bear a lesser relationship to the size of the dose than to individual idiosyncrasy.

Serum rashes were very common in the first or second week but gave no cause for anxiety.

Isolation Hospital, Leicester.—Particulars of verified cases of diphtheria discharged or died during period April 1st, 1927, to March 31st, 1928.

—	A. Malignant or severely toxic.	B. Moderately toxic.	C. Moderate and mild.	Laryngeal.	Total.
Cases	27	52	214	7	300
Percentage of cases in each group	*9*	*17·33*	*71·33*	2·33	—
Av. dose of serum (antitoxin units) ..	I.V. 71,000 I.M. 31,000	I.V. 19,000 I.M. 19,000	14,500	I.V. 22,000 I.M. 29,000	—
Paralysis—					
Palate	10	4	3	0	—
Slight cardiac.	8	12	24	2	—
Severe ,, .	6	1	1	3	—
Immediate serum reactions ...	11	19*	—	—	—
Deaths	6	nil	nil	2	8
Percentage of deaths in each group	22·2	nil	nil	28·6	—

*37 had I.V. Serum.

1. Death due to diaphragmatic paralysis, 43rd day.
2. Hæmorrhagic diphtheria: cardiac vomiting, &c., 11th day.
3. Hæmorrhagic diphtheria: cardiac paralysis, 5th day.
4. Hæmorrhagic diphtheria: cardiac paralysis, 4th day.
5. Cardiac vomiting, &c., 7th day.
6. Early cardiac failure, 3rd day. Laryngeal case.
7. Hæmorrhagic diphtheria: died 1¼ hours after admission.
8. Early cardiac failure: 3 hours after admission (membrane extending to bronchi). Laryngeal case.

Complications of Diphtheria in this Series.

The intensive method of serum treatment reduces not only mortality but also complications, especially the more serious forms of paralysis. In Group A (27 cases) the six who died had, as would be expected, severe paralysis of the heart. Of the remaining 21 cases only eight showed signs of the slighter forms of myocarditis, including extrasystoles and partial heart-block, and only ten had palatal paresis, while ciliary paresis and paresis of limbs were still rarer. Cardiac vomiting and paralysis of swallowing are now extreme rarities in these wards. Considering the extremely severe toxic condition of the cases in Group A on admission, this record is very favourable. In Group B, comprising 52 cases, 37 had intravenous serum and 15 had intramuscular serum only. Of the former seven had slight cardiac palsy (from which all recovered) and one had palatal paresis. In the 15 intramuscular cases there were six cardiac and three palatal pareses, a considerably higher incidence of paralysis than in the intravenous cases. The relative infrequency of severe paralysis greatly lightened the nursing in the convalescent stage. The difference in the actual work of the wards is quite marked. All the anxiety occurs in the acute stage or within the first two days, and after that things go smoothly.

Another way of estimating the effect of the treatment is to consider the average duration of residence in the hospital of recovered cases in Group A. This amounted to 70 days. All who are familiar with the painfully slow recovery of the survivors of the Group A type of patient under the older method of treatment know that it often involves four to six months' residence in hospital.

One of the most remarkable features of our diphtheria wards during the past year has been the rapidity with which almost every patient regained brightness of demeanour and outlook. Finally, in only one of the cases treated by large doses of serum intravenously did the carrier state occur. In this case only out of 64 cases receiving intravenous serum was departure delayed from hospital owing to persistent positive swabs. This, however, may be mere coincidence.

Objections to the Intensive Method.

Three main objections may be urged against the intensive serum treatment of diphtheria. These are: (1) expense; (2) additional work, particularly to the medical staff; and (3) danger from allergic reaction. It must be admitted that the annual increase in serum costs has been about £300 in the Leicester Isolation Hospital. Against this must be placed the saving in life, represented by a reduction of mortality from 9·3 per cent. to 2·6 per cent., and also the saving effected by the curtailment of the period of hospital treatment and lessened nursing costs. This in itself is probably sufficient to balance the additional cost of the serum. Toxic diphtheria should be regarded as an acute emergency, like a gangrenous appendix or a perforated gastric ulcer. It requires immediate expert medical attention and generally takes up half an hour of the doctor's time. It cannot properly be left to nurses, or even to medical men who merely give a haphazard subcutaneous injection of serum, which is equivalent to postponing operation on a gangrenous appendix for three days. The danger from the allergic reaction can be fairly met by prophylactic treatment and the use of adrenalin or pituitrin.

References.—(1) J. Morgenroth and R. Levy (1912), quoted in Med. Res. Council Report on Diphtheria, 1923, p. 257. (2) W. H. Park (1921) quoted in Manual of Infectious Diseases, London, Claude B. Ker, p. 131. (3) Ibid. (4) E. W. Goodall: A Text-book of Infectious Diseases, London, 1928, p. 197.

PAYING PATIENTS AT NEWCASTLE-ON-TYNE.—The annual report of Newcastle-on-Tyne Throat, Nose and Ear Hospital records that 12 months ago, owing to lack of support, some of the beds had to be closed. Rather than keep the beds unoccupied it was decided to use them for paying patients, and as a result they have been fully occupied.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN.—At the annual meeting of this hospital the Earl of Chesterfield, the President, stated that the work was being carried on under makeshift conditions, in a private dwelling which had been adapted and had long been outgrown. There are only 33 beds, whereas at least 50 are needed, together with accommodation for private patients and young children, and space for using the latest scientific methods. In 1927 the 220 in-patients stayed on an average 41 days. The hospital owns in the Uxbridge-road abundant freehold ground for building, but lacks means.

INFLAMMATIONS AND FISTULÆ OF THE SALIVARY GLANDS

AND THEIR TREATMENT.*

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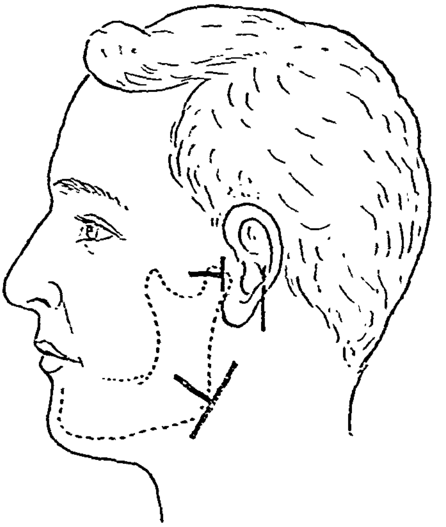
THE parotid, submaxillary, and sublingual glands are all developed from the lining epithelium of the primitive mouth in essentially the same manner. The primordium of each gland is originally a solid cord of cells growing from the epithelium into the underlying mesenchyme. The cords branch and subdivide, lumina appear, and the apices of the terminal ducts finally become dilated to form acini. The proximal portion of the original outgrowth becomes the main duct. The rudiment of the parotid appears in embryos of 10 mm.—that is, about the sixth week of intra-uterine life. It commences near the angle of the mouth in the upper alveolo-labial sulcus, grows backwards over the outer aspect of the masseter muscle, the external carotid artery, the temporo-maxillary vein, and the facial nerve; it finally expands in the recess between the lower jaw and the meatus and mastoid process. The submaxillary and sublingual glands appear later as outgrowths from the epithelium lining the alveolo-lingual groove in the floor of the mouth, at about the 11 and 12 mm. stages, that is about the seventh week of fœtal life. Whether the salivary glands are derived from ectoderm or entoderm is a question to which no certain answer can be given. If all structures developed from epithelium covering the maxillary and mandibular arches are ectodermal in origin, then the parotid glands, anterior part of the tongue, and the floor of the mouth and presumably also the submaxillary and sublingual glands, are derived from ectoderm, although some authors contend that the last named are entodermal. Mucin cells do not appear until the sixteenth week of fœtal life.

FIG. 1.



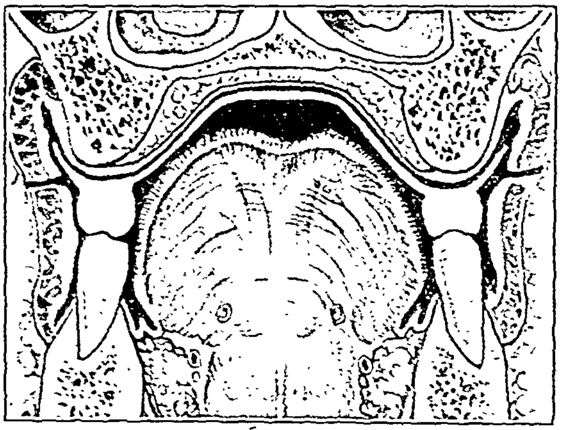
Incisions used in the treatment of suppurative parotitis.

Complete absence of the salivary glands is a very rare condition. Xerostoma or dry mouth may occur in children and adults, occasionally in several members of the same family. This is not due to absence of the salivary glands, but to suppression of the glandular secretion.

Suppurative Parotitis.

This condition is, in my experience, most frequently met with in the insane, especially in those who have to be forcibly fed by the mouth or nose. These patients always have dry mouths, even when food is being administered. There is a definite lack of psychical juices and of appetite, and indeed a definite feeling of repulsion for food. Infection reaches the parotid via Stenson's duct, and the first sign is usually swelling and fluctuation of the gland. General resistance on the part of the patient is so poor that the temperature and pulse exhibit very little variation from normal. If early incisions are not made the pus finds its way to the surface by bursting into the external auditory meatus at the junction of the osseous and cartilaginous portions. These cases are nearly always fatal unless free incisions are made into the gland. The gland itself undergoes necrosis and large sloughs are formed; these should always be removed.

FIG. 2.



Section through the mouth showing the relation of an upper denture to the parotid duct on each side.

Cope[1] reported seven cases of acute necrotic parotitis which occurred in debilitated soldiers in Baghdad during the extremely hot summer of 1917. These cases appear very similar to those which occur in mental institutions in this country. Early free incisions are imperative; mere puncture of the gland or probing it with sinus forceps is useless. The incisions advocated by Legg and Cope are very useful and allow of free drainage (see Fig. 1). Even when drainage is established the mortality is high, mainly owing to the lack of resistance. The administration of rectal and subcutaneous saline is impossible in mental cases. The author has seen ten cases among patients suffering from a depressed confusional state associated with delusions. Of these eight died.

Post-operative Parotitis.

This is now becoming rare, and as its pathology is known it should disappear entirely. In 10,210 operations performed at King's College Hospital between 1900 and 1910, 32 cases (0·313 per cent.) of parotitis occurred, all after laparotomies, while in 17,585 operations performed at the same hospital between 1918 and 1927 there were 18 cases (0·102 per cent.) of parotitis. This reduction is due to the fact that gastric and abdominal cases are more carefully prepared, and that rectal saline, with or without potassium bromide, is administered in almost every case. Further, oral sepsis is now treated before any abdominal operation is contemplated, while before 1910 oral sepsis was neglected and dental treatment was almost unheard of in the wards of a hospital. Wagner,[2] writing in 1904, stated that the mortality of post-operative parotitis was 30 per cent. In my first series (i.e., 1900 to 1910) the mortality was 37·5 per cent., while it has dropped in the second series (i.e., 1918 to 1927) to 16·6 per cent. This reduction is due to earlier operative interference in the way of incision and drainage. Incision should not be delayed until fluctuation can be elicited. It is only in the later stages of suppurative parotitis that fluctuation can be made out; this is due to the fact that the parotid is encased in a very firm capsule derived from the cervical fascia, and the texture of the gland is very firm. A ⊥-shaped incision should be made and the skin and parotid capsule incised; the gland should then be explored with a pair of sinus forceps or a probe. A single ⊥-shaped incision is often sufficient, but at times multiple incisions are necessary.

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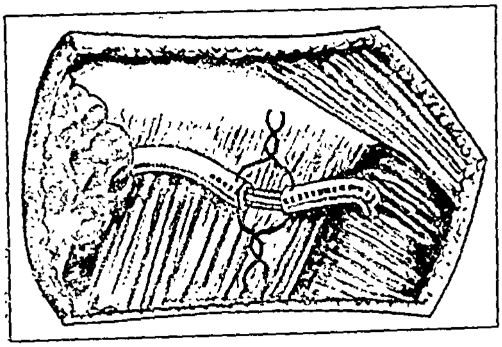
* Abstract from Erasmus Wilson lecture delivered at the Royal College of Surgeons of England on Feb. 22nd, 1928.

The total amount of saliva secreted in the 24 hours has been estimated at 2000 c.cm. If the parotid glands are responsible for half of this, one gland would secrete 500 c.cm. in the 24 hours or just over 20 c.cm. in an hour. Thus there is a continuous stream of secretion flowing down the parotid duct, and infection from the mouth is almost impossible in normal individuals. Should any factor interfere with this secretion the liability to infection increases. There can be little doubt that the vast majority of cases of post-operative parotitis are caused through infection passing from the mouth via Stenson's duct to the gland. This is borne out by the figures I have given and also by Fenwick's [3] results published in 1909 of the treatment of 300 cases of hæmatemesis by rectal feeding. He allowed his patients to suck an indiarubber teat, and did not have a single case of inflammation of the parotid gland. Rolleston and Oliver [4] found that in the medical treatment of 1000 cases of gastric ulcer the percentage of parotitis in the cases which are treated by oral starvation is 4·5 per cent., while the percentage is only 0·4 per cent. in the cases which are allowed fluid by the mouth. Fisher, of Ohio,[5] however, considers that post-operative parotitis is hæmatogenous, and that the predisposing factors are cachexia and malnutrition, causing a lowering of the patient's resistance. He also believes that "the secretion of the gland is under the influence of nerve stimuli, and that the incidence of post-operative parotid involvement is neurologically dependent upon surgical shock or inhibition of the secretory and trophic fibres from higher psychic centres." This opinion does not seem to me to be physiologically sound, as the secretion of the parotid is probably dependent on two factors only: nervous and chemical stimulation. That the second exists is proved by the fact that if the nerve supply of the gland is cut off secretion still continues, a so-called paralytic secretion which is the result of chemical stimuli (vide infra).

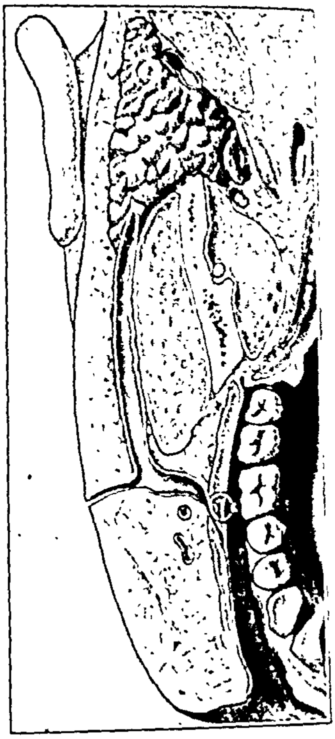
FIG. 3.



Method of suture in cases of recent injury to the parotid duct. A piece of silkworm gut acts as a dowel.

Occasionally unilateral or bilateral parotid swellings are due to a large upper denture which causes irritation of the gums and obstruction of the orifice of Stenson's duct. The first case that came under my observation was a woman aged 45 who had an upper denture fitted, and after wearing it for two days came up to hospital complaining of a swelling of the face and limitation of movement of the jaw. Her history was that the swelling began during breakfast and gradually increased in size. Distinct lobulation of the parotid gland could be felt, and Stenson's duct could easily be traced across the cheek. The orifice of the duct in the mouth was difficult to find, but while looking for it and at the same time pressing on the duct a plug of mucus was expelled into the mouth; this was followed by a flow of saliva and the disappearance of the parotid swelling. My curiosity was aroused by this case, and I looked up the literature and found that Jardet [6] recorded four cases occurring in adults in 1920. The condition is generally due to a badly-fitting denture (Fig. 2) which is not cleansed daily. The remedy is a properly fitting denture combined with the use of a potassium chlorate mixture, as this salt is excreted via the saliva.

FIG. 4.



Method of forming a new opening into the mouth by means of a suture through the buccal mucous membrane.

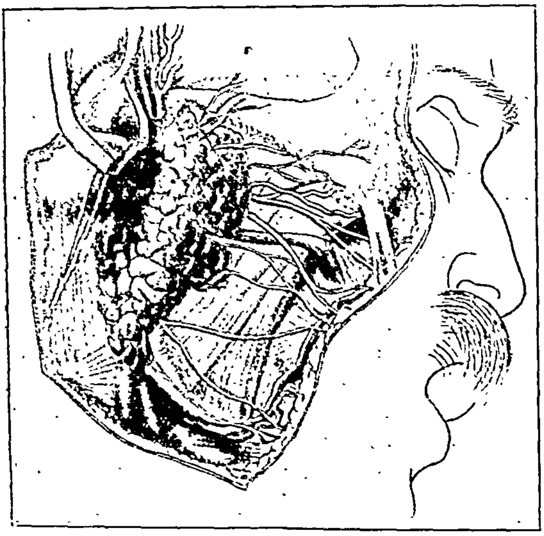
Fitzwilliams[7] has recorded an interesting condition of emphysema of the tissues of the face and neck which is brought about by inflation through the ducts of the salivary glands. Apparently self-inflation was a common form of malingering among the Chinese labour battalions in France during the Great War. The men would fill their mouths with as much air as possible and then strike their cheeks rapidly; this caused air to be forced gradually along the ducts and into the smaller canals of the glands. These small canals became greatly swollen and burst in places, allowing air to escape into the tissues. According to Fitzwilliams no alarming symptoms resulted, nor were there any after-effects; the emphysema rapidly disappeared. I have tried the experiment on dogs by passing a cannula into the parotid duct, and find that it is very easy to produce emphysema of the face and even half the body, the amount of emphysema being proportional to the amount of air forced along the duct and the pressure exerted. The symptoms are alarming at first, but usually disappear by the following day.

Salivary Fistulæ.

The only fistulæ of practical importance are those in connexion with the parotid and its duct. Fistulæ of the submaxillary gland tend to heal of their own accord; the rare cases which do not are easily treated by excision of the gland. Parotid fistulæ may be divided into two groups: (1) fistulæ of the duct, (2) fistulæ of the gland.

Fistulæ of the parotid gland and duct are most frequently caused by injury or suppuration around a calculus. Operations for removal of glands in the upper part of the neck may cause injury to the lower part of the parotid. A small fistula may result which tends to heal at once; if, however, the wound becomes infected a permanent fistula invariably results. The nearer fistulæ of the parotid are to the gland the more difficult they are to cure. They never tend to heal spontaneously, and the portion of the duct in front of the fistula frequently becomes stenosed and sometimes obliterated. Should the fistula be situated in front of the masseter muscle operation will often cure. In recent cases, such as a stab injury, the wound should be opened up and the two ends of the duct isolated.

FIG. 5.



Dissection of side of face showing the relations of the facia nerve to Wharton's duct.

A piece of stout silkworm gut is passed from the mouth through the orifice of Stenson's duct and out on to the face; it is then passed into the proximal portion of the duct and thus acts as a dowel. The wall of the duct is sutured over the piece of silkworm gut, and the skin wound closed. In order to prevent a clot forming in the duct at the line of suture the silkworm gut is retained in situ until the patient recovers from the anæsthetic. This method is only of use when the wound is recent (Fig. 3). Tees[8] advocates the use of catgut to act as a dowel, but the catgut swells and may cause complete blocking of the duct. If in a recent case there is difficulty in getting apposition of the divided ends of the duct the proximal portion should be ligatured; in the absence of sepsis this will cause atrophy of the parotid. If, however, infection is present septic parotitis will follow. Treatment by the ligature method is far from new and has recently been revived by Morestin[9] in France.

FIG. 7.

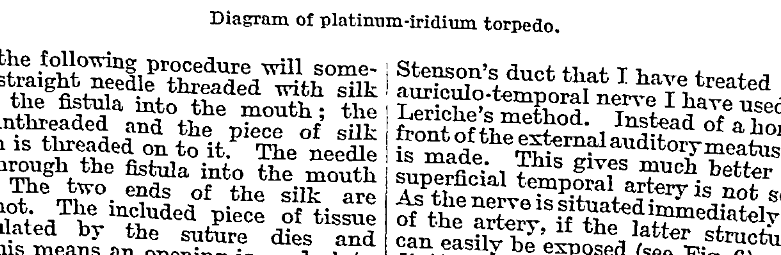
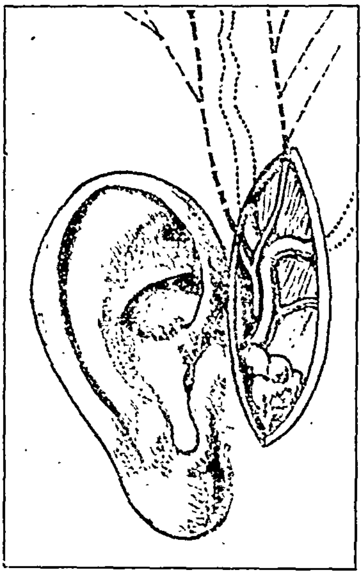


Diagram of platinum-iridium torpedo.

In old-standing cases of premasseteric fistula the following procedure will sometimes suffice. A straight needle threaded with silk is passed through the fistula into the mouth; the needle is then unthreaded and the piece of silk outside the mouth is threaded on to it. The needle is then inserted through the fistula into the mouth a second time. The two ends of the silk are then tied in a knot. The included piece of tissue which is strangulated by the suture dies and sloughs, and by this means an opening is made into the mouth. As the parotid secretion has now a free vent into the mouth the fistula heals (Fig. 4).

Fistulæ of the parotid duct which are situated in the proximal part—namely, over the masseter muscle—are, as may be imagined, very difficult to cure, and nearly 30 different operations have been devised. Most of them leave considerable scarring on the face, frequently damage the lower branch of the facial nerve, causing paralysis of the muscles at the angle of the mouth, and rarely cure the condition (Fig. 5). To my mind there is only one justifiable procedure, and if this fails, the secretion of the parotid should be cut off by dividing the auriculo-temporal nerve. The procedure is an old one, but is much neglected at the present day, when operative interference for every condition is carried out only too frequently. By means of a small fine malleable probe which is passed from the mouth along the duct and out of the fistula on to the face, a piece of silk is attached and drawn out on the face. To the end of the silk is attached a fine piece of drainage tubing, and this is drawn out of the fistula, leaving one end in the mouth while the other is projecting on the face. Saliva may find its way along the side of the drainage-tube into the mouth. After a few days the drainage-tube is drawn so far into the mouth that it no longer projects from the fistula. Finally after a week it is withdrawn altogether. In some cases the result of this method is admirable and the fistula remains completely closed; should infection of the duct be present, however, the rubber tube may cause parotitis.

FIG. 6.

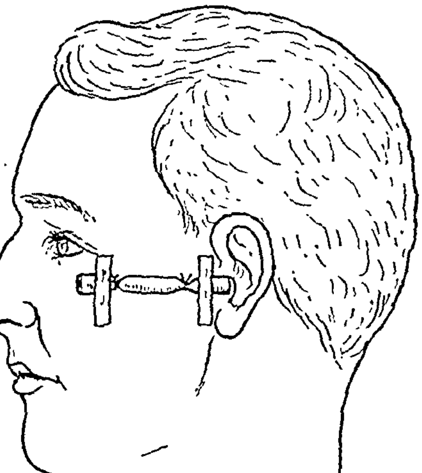


Method of exposing the auriculo-temporal nerve. It can be seen lying just behind the superficial temporal artery.

There is only one certain method of closing a fistula of Stenson's duct when sepsis is present, and that is by division of the auriculo-temporal nerve. This method was first advocated by Leriche[11] some 15 years ago. Since that time several surgeons, among whom Morestin[9] and Ferraini[12] may be mentioned, have given this method a good trial with excellent results. In the seven cases of fistulæ of Stenson's duct that I have treated by division of the auriculo-temporal nerve I have used a modification of Leriche's method. Instead of a horizontal incision in front of the external auditory meatus, a vertical incision is made. This gives much better exposure, and the superficial temporal artery is not so liable to injury. As the nerve is situated immediately in the deep aspect of the artery, if the latter structure is retracted it can easily be exposed (see Fig. 6); the nerve is then divided with a knife, the proximal portion grasped with a pair of Spencer-Wells' forceps, and as much of it as possible avulsed by firm traction. The fistula healed quite quickly, and after a month the amount of secretion coming via Stenson's duct into the mouth was reduced by one-half. Even division and avulsion of the proximal end of the auriculo-temporal nerve does not cause complete cessation of secretion of the parotid gland. Further, the secretion, which may be termed a paralytic secretion, persists for years, the longest period of which I have a record being six years.

The presence or absence of secretion from the gland is investigated by applying a little citric acid to the tongue and side of the mouth. If the gland is secreting a drop of saliva can always be seen at the papilla on the inside of the cheek. The secretion after division of the nerve is always much less than that of the other side, but the methods of observation in human subjects are not very accurate. One would hesitate to place small cannulæ into the orifices of both parotid ducts and try and collect the saliva therefrom; the risk of infection and its aftermath, septic parotitis, is too great. The most likely cause of the paralytic secretion is chemical stimulation. It may therefore be assumed that the normal secretion of the parotid is not only dependent upon the secreto-motor nerve-supply, but also upon some chemical stimulation. Langley has suggested that a local nervous mechanism may be responsible, but more recently McDowall[13] has pointed out that the activities of the parasympathetic are apparently the same as that of alkali, as judged by the effect on the heart, the pupil, and the blood-sugar. He states that this effect of alkali appears to be increased when the nervous connexions of the organs are increased. It may be, then, that when the nervous control of the gland is removed the normal alkalinity of the blood is sufficient to maintain secretory activity.

FIG. 8.



Method of applying radium to parotid fistula.

Fistulæ of the Parotid.

Fistulæ of the parotid gland tend to heal of their own accord. For those which do not the two methods of treatment are: (1) Radiotherapy, and (2) avulsion of the auriculo-temporal nerve.

Radiotherapy rarely fails to cure and is quite simple; 250 mg. of radium is enclosed in a platinum iridium torpedo, the thickness of which is 0·5 mm. The torpedo itself is encased in another platinum tube, 0·5 mm. in thickness, in order that the beta radiations may be cut off. The platinum tube is then placed in a rubber tube to facilitate its application (Fig. 7). The fistula and its surrounding parts are covered with lint, in order to cut off any secondary radiations from the metal filters (Fig. 8). A four-hour application is usually sufficient, but should the skin be somewhat thickened and indurated from the constant discharge of saliva, a six-hour application is advisable. Whatever length of application is used, it is advisable to give a hypodermic injection of atropine (gr. 1/100) half an hour beforehand: this lessens the secretion of the gland during the time the radium is being applied.

X rays have been used in the treatment of parotid fistulæ but are not so constant in their action. Three pastille doses, with a weekly interval between each, should be given through a filter of 3 mm. aluminium. Here again atropine should be administered prior to each treatment.

Should this method fail, avulsion of the auriculo-temporal nerve should be perfoimed.

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THE RHEUMATIC LUNG.

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(WITH COLOURED PLATES.)

THE term "Rheumatic Pneumonia" is an old one and was more in vogue in the medical literature of a past generation than of to-day. Possibly this is because the acute rheumatic fever of adults is now less common.

The condition I am about to describe contrasts so much clinically with what we usually know as pneumonia, that I prefer to use the simpler term, "rheumatic lung."

The microscopical appearances of these consolidations (1) indicate an inflammatory reactive process; (2) are unlike anything hitherto described in the human lung; (3) are remarkably constant from case to case; and (4) bear a strong resemblance to the lesions described by Aschoff and Tawara,[1] Carey Coombs,[2] and others, as pathognomonic of rheumatic infection in other parts of the body. If these contentions can be established, we have not only a demonstration of an entirely new type of inflammation of the lungs, but also a strong confirmation of the thesis advanced by Carey Coombs that the lesions of "rheumatism" (childhood type) show a specific form of reaction and therefore indicate probably a specific virus.

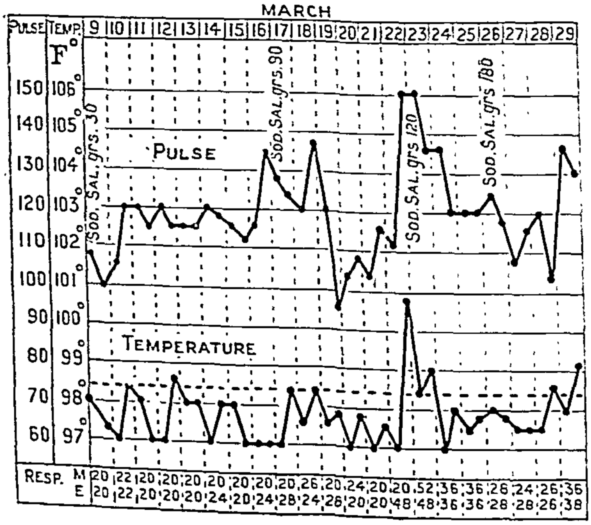
During the past two and a half years I have obtained post-mortem material from six of my patients who have displayed this peculiar consolidation of the lungs. Not all were children, their ages being respectively 7, 8, 9, 13, 26, and 33; but all gave evidence of active rheumatic infection, with the possible exception of the woman of 33, who had mitral stenosis, but whose heart muscle was unfortunately not examined to determine the presence or absence of Aschoff's nodules.

I propose to deal first with the general clinical aspect of this condition, then to describe the naked-eye and microscopical appearances of the lungs, and finally, after a brief description of the individual cases, to summarise and discuss my conclusions.

General Clinical Considerations.

Those who have experience of disease in childhood are familiar with certain more or less extensive patches of dullness which are liable to appear over the back of the chest in children suffering from active rheumatic carditis. They appear insidiously, being frequently unaccompanied by pyrexia or noticeable increase of respiratory-rate, and are therefore only detected by routine examination. Cough is sometimes present at the onset, but is of a mild variety and attracts little attention in a patient already seriously ill. The dullness sometimes appears quite rapidly, extending perhaps over the greater part of one lobe in the course of two or three days; it then may remain stationary over a long period lasting into months, and, finally, may clear up as rapidly as it began. The breath sounds over the dull area are often loudly bronchial, but there is every grade between this and muffled or completely absent respiratory sounds. During the quiescent stage no adventitious sounds are heard, but if the stage of onset is observed a few soft crepitant sounds are not infrequent.

It has been held by most observers that this dullness is present at the left base only, and, following the old observation of Bamberger[11] that dullness in this situation is common with pericardial effusion, the condition is usually considered to be a collapse of the lung due to the pressure of an enlarged heart or distended pericardial sac. My own observations, however, spread over a number of years, directly contradict the belief in the immunity of the right lung. It is true that the dullness usually begins at the left base and is most intense in that situation, but careful percussion will often reveal slighter dullness and altered breath sounds on the other side, and in a few cases the dullness is most intense on the right. It was, in fact, this last observation that first made me seriously doubt the current theory of collapse, and it will be seen from the post-mortem reports of the six fatal cases that in all of them the right lung was affected, and to about the same extent as the left. The reason for the earlier appearance and greater frequency of left-sided affection will be discussed at the end of this paper.



Although this condition appears only in those severely affected by rheumatism, yet it does not usually appear to add much to the gravity of the prognosis, and the great majority live for the dullness to clear up. The cases recorded in this paper showed a much more rapid extension of the dullness than is seen in the average case, and the symptoms were naturally more acute, but even in these it was remarkable how little the temperature and respirations were affected by the onset of the lung consolidation.

Take, for instance, the case of W. W. (see Chart), who had been in bed, under observation, for six weeks previous to the first appearance of a small patch of dullness at the angle of the left scapula on March 25th. Although the dullness increased at such a rate that by the 29th the whole of both sides, back and front, appeared to be dull, yet the respirations were for the greater part of these four days between 24 and 28 per minute, and the pulse-respiration ratio was approximately 4½ to 1. The temperature showed a brief rise on March 22nd, three days before any lung dullness was detected, but during the period when the dullness was so rapidly extending, the temperature was mostly subnormal. With regard to the temperature it must be noted that most of the patients were taking salicylate of soda, and that E. W., who was not, showed a temperature quite comparable to that of an ordinary pneumonia. In spite of this she, in common with the other patients whose temperatures were low, showed a p./r. ratio of approximately 4 to 1. The respirations were not only slow but there was scarcely any respiratory distress throughout the series of cases; the one definite exception being the case of I. D., in whose pericardium there was half a pint of fluid.

Cyanosis was very noticeable during the last day or two of life in those patients whose lungs were nearly solid throughout, but the amount of lung solidification in proportion to the degree of intensity of respiratory symptoms was throughout the series a surprising phenomenon.

Morbid Anatomy.

Macroscopical.—The extent of the pulmonary consolidation was a remarkable feature. In one case (W. W.) the only aerated parts seemed to be a strip along the anterior border of each lung, and most of the right middle lobe. In another (I. D.) all parts of both lungs were affected, but the upper lobes appeared to contain some air. In another (E. C.) the right lung was completely solid throughout, but the left, though very largely solid, floated in a submerged position in water. In another (A. B.) three-quarters of the right lung and a quarter of the left lung were solid. The other two showed consolidation of both lower lobes. There was no sharp demarcation between solid and air-containing lung.

The appearance of the affected parts was quite characteristic and unlike that seen in any other form of pneumonia. Its consistency was not unlike that of solid indiarubber, very tough, and non-friable on the cut surface. The colour, on section, was a shade of purplish red, quite homogeneous in tint and showing none of the "granite" or "marbled" appearance of other pneumonias. Scraping with the knife produced no exudation. In one case the bronchi exuded a blood-stained fluid on pressure.

So characteristic were the naked-eye appearances that in the case of E. W. the condition was recognised at once by our pathologist, although she had seen only one case previously.

Microscopical.—Before describing the microscopical appearances I will quote from Coombs'[3] description and explanation of the submiliary nodules of the heart.

> "The nodules consist of a groundwork of fibrin, surrounded and interrupted by various cells. Of these, the most important are certain large cells which form the characteristic feature of the nodule; there are also leucocytes and plasma cells."
>
> "The characteristic large cells vary a little in shape according to the shape of the space in which the nodule develops; in rounded nodules the cells are often globular, but even in such they may be fusiform, and this is the form they tend to take. That they are soft is shown by their taking shape from one another so as to give flat sides and quadrilateral outlines to each. The largest cell is of such a size that, measured from pole to pole, it is equal to one-third or one-quarter of the diameter of the microscope field, as seen with 1000 magnification. Its cytoplasm, which is very finely granular, takes both basic and acid dyes readily, so that the cell is a dark object in the field. In some the cytoplasm looks opaque and the cellular outline is apt to

be lobular; such cells are probably being destroyed by toxins, perhaps by those which call them into being. There may be as many as seven nuclei in one cell, apparently without any plan of arrangement; though as many of the cells are so narrow that they can carry but one nucleus abreast, they lie in a sort of chain along the long axis of the cell. The chromatin thread of the nucleus stains sharply with hæmatoxylin, each nucleus appears as a space bounded by a thin black line and clear centrally except for several sharp black dots which represent cross-sections of the chromatin thread.

"The stages of the tissue reply to irritation by the *Streptococcus rheumaticus* would appear to be as follows: First, the endothelia of the smaller blood-vessels and lymphatics proliferate; this is manifested in partial or complete occlusion of vessels, with or without thrombosis, in the dissemination of "endothelial leucocytes," which are mainly collected in perivascular foci, and in the building up of new capillaries. Second, the perivascular connective tissues display a fibroblastic reaction, especially around the newly formed capillaries. Third, leucocytes arrive in the disturbed area; in most areas the polymorphonuclears are represented but sparingly, but the more severe the attack, the more likely they are to appear, and in some spots they even dominate the picture, especially where large vessels are closed by inflammatory thrombosis. The usual appearances, therefore, are those of a blood-borne infection of a virulence so moderate that it is for the most part dealt with successfully by the first line of defence—the vascular endothelia."

On comparing under the low power sections of the lungs from my cases with those from a lobar or broncho-pneumonia, certain contrasts are seen at once.

PLATE I. is from a typical broncho-pneumonia and shows large alveolar cavities with thin walls, the cavities being nearly filled with a mass of fibrinous exudate and polymorph leucocytes slightly shrunken away from the walls, and such red blood corpuscles as are present in the walls are nearly all contained within small vessels.

PLATE II. is a microphotograph from W. W. (Case 6). The alveolar walls are seen to be some 8 or 10 times as thick as in the former plate; the red blood cells are not contained within vessels, but are widely diffused among the other cells of the walls; the cavities of the alveoli are quite small and are encroached on by small outgrowths from the walls.

PLATE III. shows: (1) proliferation of the endothelium lining a capillary; (2) outgrowth of similar endothelial cells in all directions, so as to make it difficult to distinguish wall from cavity; and (3) general diffusion of red blood cells among the endothelial cells.

PLATE IV. enables us to see the cells which are in all parts of the section like those described by Coombs.

These cells form the immensely thickened walls and are seen budding out in little tufts into cavities of the alveoli. In some places the walls can be traced with fair ease, but in others, where apparently the process has reached a more advanced stage, the alveolar structure has been entirely replaced by masses of these cells, either packed closely together or drawn out into a syncytioid mass. Multinucleate cells are fairly frequent, though I have not found any cells with more than five nuclei. In all but one of my cases these endothelial cells form the vast majority of the structure, being mixed with only a few fibroblasts and polymorph leucocytes, but in one (J. J. C.) the polymorphs were quite numerous, though even here there was the same massive endothelial background on which the leucocytes were dotted. A still later stage of the process shows the endothelial cells beginning to form new blood-vessels. In one very acute case the mediastinal glands were enlarged and very red, and sections showed not only a notable vascularity but the invasion and replacement of considerable areas of lymphoid structure by endothelial cells of the same type. In cases where the heart muscle was cut, typical Aschoff's nodules were found.

The following is the description kindly written for me by Dr. Clara Tingle, pathological assistant to the Sheffield Royal Hospital.

"Large endothelial cells are the predominating ones found in this condition. They are constantly present and in large numbers. The average diameter appears to about 4–6 times that of a red cell, but they vary according to the pressure put upon them by surrounding structures. The majority of these cells are mononuclear, the nucleus being equal in diameter to about one-third the diameter of the cell. Many cells, however, are multinucleated, there being in some instances as many as five or six nuclei per cell. In these "giant cells" the nuclei are separate from one another and are arranged irregularly within the cell. The nuclei always appear as a dark-staining ring with a central space, which often is unstained but which sometimes shows darkly staining dots. The cytoplasm stains deeply and is faintly granular. Sometimes carbon pigment is found within the cells. (I have not found any showing active phagocytosis to other cells.) In areas where these cells are fewer in number they tend to be wholly within the alveolar walls, causing thickening and distortion of these structures, but in areas where the change appears more advanced the cells lie in large numbers within the alveoli. They are accompanied by red blood cells and a few plasma cells, and the alveolar contents do not tend to retract from the walls during preparation of the section as they do in lobar or broncho-pneumonia. There are also found a few areas in which the lung structure is completely lost and is replaced by a mass of these cells separated only by red blood cells, plasma cells, and a few fibroblasts."

Individual Cases.

The following are short descriptions of individual cases:—

CASE 1.—I. D., male, aged 8. Admitted Dec. 9th, 1925; died Dec. 19th, 1925. Onset two months ago: pain in the left chest and back; sweating; frequent abdominal pain; occasional joint pain; always tired; dyspnœa on exertion; no sore throat.

On admission: Tongue furred; immense tonsils; muco-purulent discharge from the naso-pharynx; no nodules; no pallor. Heart: There is much visible pulsation; the left border 5 in. from the middle line; systolic and diastolic murmurs at the apex. Lungs: Crepitations and slight dullness at the left base.

Dec. 15th: Heart breadth 6½ in.; pericardial friction. 17th: Dullness and crepitations at right base. From this time onwards increasing respiratory distress and inability to lie on left side.

Pulse-rate: Varied from 120 to 145 throughout stay in hospital. Temperature: 100·4° F. on admission, slowly falling to normal on the 13th; on the 15th it rose again to 101·2° F., falling to normal on the 17th. Respirations: From Dec. 9th to 15th, 20 to 36 per min., the average being about 28. From Dec. 15th to 18th, 36 to 40 per min., and within the last 30 hours before death rising rapidly to 78. P./r. ratio approximately 4½ to 1 up to the 15th and from then 3¾ to 1 to the day before death.

Autopsy.—Pericardium contains half-pint of clear fluid; small area of fibrinous exudate on the anterior surface of the right ventricle; the whole of the pericardial surface slightly dulled. Tricuspid and mitral and aortic valves show small pale vegetations, on the two former valves in the form of long narrow bands on the auricular surfaces, but on the aortic in the form of groups in the centre of the ventricular surface of each cusp. Lungs: Massive consolidation of the whole of both lungs, but some air can be squeezed from both upper lobes; the consolidation is of india-rubber consistency; non-friable; purplish red; cut surface not like granite.

CASE 2.—E. W., female, aged 26. Admitted Jan. 13th, 1926; died Jan. 17th, 1926. Had rheumatism and chorea in childhood. Run down and lost weight for one year. Seven weeks ago taken ill with pain first in the back and then in the right side of the chest; sweating; in bed for two days; then up for seven days; relapse for ten days with cough and slight delirium added; again three weeks up and about; then, on Jan. 12th, 1926, temperature rose.

On admission: Breathing quite comfortably and without distress. Heart: Rapid; size not determined owing to dullness of the left lung. Lungs: Dullness at both bases; breath sounds weak at the right base; bronchial breathing at the left base.

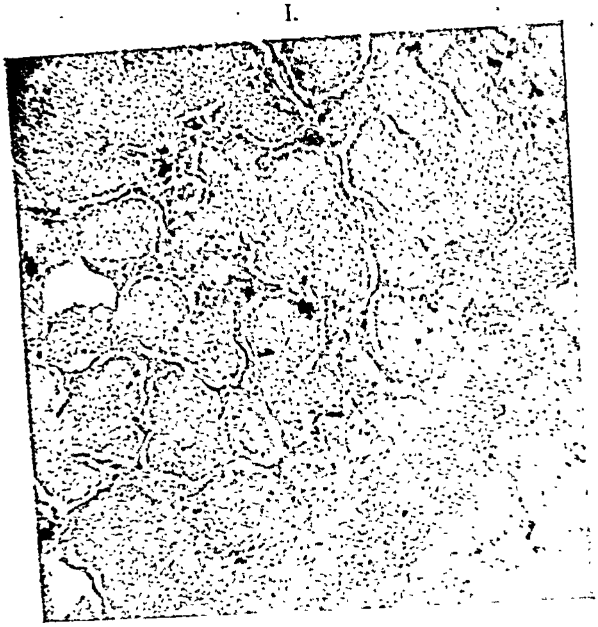
Progress: Spread of the dullness, especially on the right: bilateral friction; jaundice by the 15th; never any respiratory distress.

Pulse-rate from 120 to 150. Temperature from 101° to 105°. Respirations from 28 to 36; above 36 only during the last 24 hours of life. P./r. ratio approximately 4½ to 1 during first three days; 3¾ to 1 during last 24 hours before death.

Autopsy.—Pericardium: Fibrinous pericarditis with recent adhesions; hypertrophy of the left ventricle; old mitral stenosis; a few small pale vegetations over auricular surface of mitral valve. Lungs: A little fibrinous pleurisy at both bases; both lower lobes airless; upper lobes congested; bronchioles exude blood-stained fluid on pressure. The consolidated part india-rubber like; very tough; non-friable; homogeneous in colour.

DR. A. E. NAISH: THE RHEUMATIC LUNG.

I.



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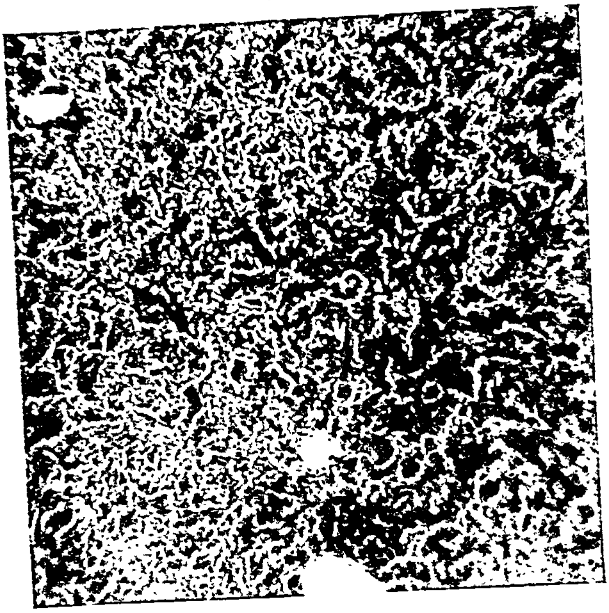

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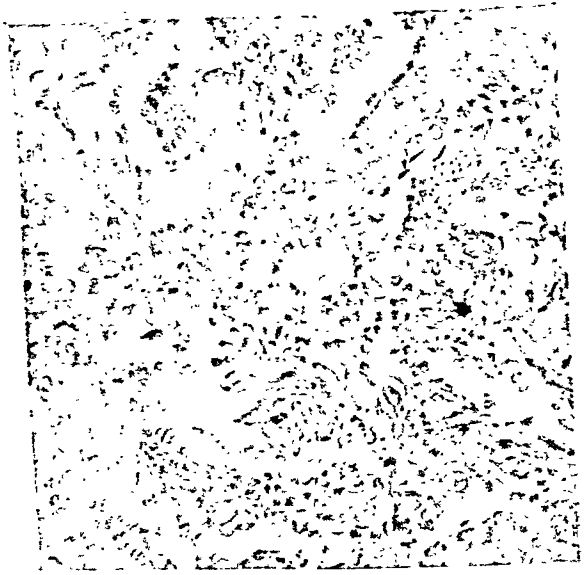

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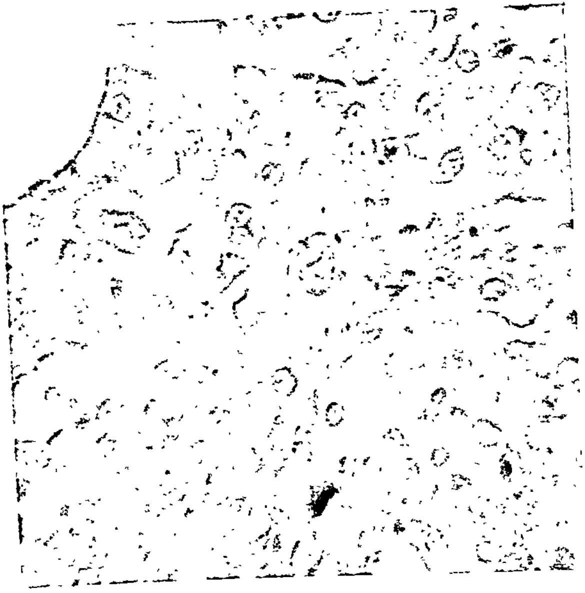

Plate I. (× 60) is from a typical bronchopneumonia and shows large alveolar cavities with thin walls, the cavities being nearly filled with a mass of fibrinous exudate and polymorph leucocytes slightly shrunken away from the walls, and such red blood corpuscles as are present in the walls are nearly all contained within small vessels.

Plate II. (× 60) is a microphotograph from Case 6. The alveolar walls are seen to be some 8 or 10 times as thick as in the former plate; the red blood cells are not contained within vessels, but are widely diffused among the other cells of the walls; the cavities of the alveoli are quite small and are encroached on by small outgrowths from the walls.

Plate III. (× 280) shows: (1) proliferation of the endothelium lining a capillary; (2) outgrowth of similar endothelial cells in all directions, so as to make it difficult to distinguish wall from cavity; and (3) general diffusion of red blood cells among the endothelial cells.

Plate IV. (× 520) shows in all parts of the section the characteristic large cells described by Coombs.

CASE 3.—E. C., female, aged 13. Admitted March 13th, 1926; died March 20th, 1927.

December, 1926: Sore throat and pain in the knees; was in bed two weeks and afterwards was kept from school. Feb. 17th, 1927: Came to the out-patients' and was advised to stay in bed. March 7th: Much worse; weakness and pain in the knees.

On admission: Pallor. Heart: Dullness 1¾ in. to the right and 5 in. to the left of the middle line: systolic and diastolic murmurs at the apex. Lungs: No dullness detected.

March 18th, 1927: Vomiting; cyanosis; restlessness; pain: dullness at the left base; pericardial friction; liver very large. March 19th: Dullness at right and left bases, which subsequently increased rapidly.

Pulse-rate, 100 to 120. Temperature on first two days after admission, 98·8° F.; after that, never above 98·4° F. Respirations up to the 16th, 20 to 28, afterwards 22 to 40. P./r. ratio approximately 4½ to 1, except for a brief period about 24 hours before death.

Autopsy.—Pericardium: A little fibrinous exudate about origins of great vessels and less at apex; about 2 oz. fluid in sac. Heart: Muscle flabby and mottled; moderate dilatation: small vegetations at bases of aortic cusps and on auricular surfaces of mitral and tricuspid valves. Lungs, pleuræ: A little fibrinous exudate at right base: whole of right lung solid: sinks in water; tough, non-friable; non-granite-like. Left lung similar but less affected, many parts floating; consolidation not circumscribed.

CASE 4.—A. B., female, aged 33. Admitted March 31st, 1927; died March 31st, 1927.

History.—Rheumatic fever at 7 years old; heart affected; very delicate since; frequent aching of limbs; pneumonia in 1922. Dec. 31st, 1925, became ill with bilateral chest pain and cough; admitted on Jan. 3rd, 1926, showing widespread râles, friction at left base, and double bruit over the cardiac apex. The râles cleared up within a week, leaving a patch of dullness, bronchial breathing, and increased vocal vibrations at the left base, which in turn cleared after a few days. The temperature was never above 100, and for a good part of the acute stage was subnormal. Respirations after first two days, 20. After this she returned to her usual state of invalidism. For a few days before death more dyspnœic but not laid up, and she actually walked up to the out-patient department on the day of her death.

On admission: No notes of importance, owing to her rapid death shortly after admission.

Autopsy.—Heart: Dilatation and hypertrophy of right ventricle and right auricle; dilatation of the left auricle. Mitral valve sclerosed; button-hole orifice admitting one finger. Pericardium, normal. Lungs: Consolidation of the whole of the right lower lobe and one-third of the right middle lobe; slight consolidation at the left base; consolidated parts show rubbery consistency, toughness, non-friability, and homogeneity of colour.

CASE 5.—J. J. C., male, aged 9. Admitted Sept. 7th, 1927; died Jan. 28th, 1928. Three years ago had an illness called pneumonia, since then has had pain in the left chest; dyspnœa on exertion; listlessness; poor appetite; sweating. Lately, bumping of the heart.

On admission: Languid; pale; sweating. Heart: left border 5 in. from the middle line; double bruit at apex, the diastolic murmur being loud. Lungs: nothing abnormal detected. During September vomited from time to time.

Oct. 3rd, 1927: Nodules on occiput, right wrist, left elbow, and left external malleolus. No evidence of pericarditis or pulmonary consolidation. Looked very ill. Respiratory average about 31. Antistreptococcal serum given on Oct. 10th, 18th, 25th, and Nov. 2nd. Nov. 14th: Much better, nodules nearly gone. Through the rest of November and December very well.

Jan. 7th, 1928: Pain in knees and chest; 9th, vomiting; 11th, rash of raised red patches, heart dullness 2½ in. to right and 5½ in. to the left of the middle line; 13th, dullness at left base, no bronchial breathing; 16th, 17th, 18th, and 23rd, antistreptococcal serum; 20th, dullness at the right base. Temperature range, after the 7th, was usually 99° to 100° F., but there was a rise on the 7th to 101·4° F., and another between Jan. 12th and 17th to a maximum of 101·6° F. Respirations from 23 to 32 up to Jan. 24th, after this 32 to 36. Pulse-rate averaged 120. P./r. ratio approximately 4 to 1 up to last 48 hours.

Autopsy.—Heart: very large; largest diameter 7 in. Right auricle much dilated; other cavities moderately so. Pericardium adherent; no recent pericarditis. Lungs: Complete consolidation both lower lobes; india-rubber consistency; non-friable; purplish-red, not mottled.

CASE 6.—W. W., male, aged 7. Admitted Feb. 14th, 1928; died March 30th, 1928. Movements for past two months.

On admission: Acute chorea; pallor; wasting; indifference to surroundings; nodules on right occiput, each elbow, near metacarpo-phalangeal joints and on dorsa of both feet. Heart: Breadth 4 in., soft-blowing apical systolic murmur. Progress: Steady improvement; after 2½ weeks, better colour; scarcely any chorea; appears plumper; taking interest and chatting.

March 16th: Pulse-rate went up and the cardiac dullness was enlarged by 1 in. 22nd: Rise of temperature; heart-rate, 160; respirations, 52; vomiting; diastolic bruit at apex. 25th: Small area of dullness at angle of left scapula; crepitations; respirations, 36. 26th: Dullness increasing; respirations, 28. 27th: Dullness and crepitations at right base; respirations, 24 to 28. After this very rapid increase of dullness. P./r. ratio very seldom below 4 to 1.

Autopsy.—Heart: Moderate dilatation of the right ventricle, left ventricle, and right auricle. Valves: Aortic and mitral, vegetations in groups along the line mid-way between attachment and free edge; mostly white, but small hæmorrhagic points. No pericarditis; no increase of pericardial fluid. Lungs: A few ounces of fluid in either pleural cavity. Nearly solid; only right middle lobe and anterior free edges showing any air. Consolidation is of india-rubber consistency; non-friable: purplish-red; cut surface, not like granite. Mediastinal glands: The size of beans; very red; semi-soft. Liver: Large and fatty. Mesenteric glands: Similar to mediastinal.

Discussion.

The appearance of the lungs in these cases is apparently quite different from anything that has been hitherto described. Dr. Robert Hutchison informs me that over 20 years ago the pathologist at the London Hospital, Dr. Salaman, prepared sections from the lungs of a rheumatic case and found similar appearances, but that the slides were lost. Pichon and Lardé-Arthés [4] have described what they call "multiple pulmonary infarcts" in association with active carditis, which will be referred to in a moment. Coombs, Miller, and Kettle [5] have described a remarkable endothelial proliferation of the vessel walls in the lungs of rabbits which have been inoculated with virus from rheumatic cases. Apart from this I have been unable up to the present to find any precise accounts in the literature of pathological examination of these pulmonary consolidations.

These lung appearances are strikingly like those described by Coombs [3] in cardiac submiliary nodules, the main difference being that they suggest an earlier stage of development in which endothelial proliferation entirely overshadows fibroblastic reaction. It is also to be noted that in the lung preparations there is evidence of considerable effusion of red blood corpuscles from the damaged capillaries, whereas this is not a feature of the submiliary nodules. This, too, I take to be an indication of an earlier stage of development before absorption of cells has taken place. The highly vascular nature of the alveolar wall must also be taken into consideration in making a comparison with the rheumatic lesion in other sites.

In this connexion it is interesting to bring forward microscopical appearances from another case to indicate that endothelial proliferation and effusion of red blood cells are closely connected. A girl of 17 years (D. Q.), under the care of my colleague, Prof. Arthur Hall, died on Nov. 5th, 1925, with pericarditis and pulmonary consolidation. The greater part of the lung section showed an ordinary broncho-pneumonic reaction with the red blood cells contained in little groups within the capillaries, but in certain small portions of the slide there was obvious blood effusion, and here the endothelial proliferation was most remarkable, the large cells budding out in long strings.

At this point I should like to discuss the case recorded by Pichon and Lardé-Arthés.[4] The so-called infarcts, which were scattered about in an irregular fashion through the lungs and had no sharp margin or definite shape, were attributed by the authors to rupture of vessels by high pressure (it was expressly stated that embolism or thrombosis of vessels was carefully looked for without success). The microscopical appearances are recorded very briefly; merely the words "Les alvéoles pulmonaires sont remplis d'hématies." When this case is compared with some of my cases which were very definitely hæmorrhagic, and in one of which blood could be squeezed from the bronchioles, it appears to me possible that a further examination of the sections might reveal in their case an earlier stage of the endothelial reaction to be at the bottom of the hæmorrhage. This seems to me especially likely, as the case showed a definitely febrile carditis, with Aschoff's nodules throughout the heart, and there was nothing in the notes to suggest very high venous pressure.

Another point that is worth discussing is whether the pulmonary consolidation in these fatal cases is the same as in the more familiar non-fatal cases. Careful consideration of the signs and symptoms of the two classes has led me to the belief that they are identical. There are obvious differences in intensity, but even the most acute display the same insidious onset and lack of disturbance of respiration up to the point when loss of aerating surface is extreme. In fact most of these pulmonary consolidations would have been missed during life had not my interest in the subject led me to frequent examination of the bases. Transition cases also are reported in the literature. Take, for instance, the small epidemic of six cases described by Cheadle[12] in 1888. In this are particularly noted the lack of cough, expectoration, and respiratory distress, but the inflammatory nature of the consolidation is indicated by a little rise of temperature, and the presence of some fine crepitant sounds on the day of onset.

Not all pulmonary complications of rheumatism are of the insidious type described above. Achard,[7] following Bernheim,[8] has distinguished three forms: acute general congestion, partial congestion, and latent congestion, but he does not particularise very carefully the respective cardiac states of the patients displaying these syndromes. Where high pressure is present in the pulmonary veins it is obvious that an important complicating factor cannot be excluded. My patient (A. B.), who had a fairly high grade of mitral stenosis, was in for so few hours during her fatal illness that no serious observations could be made; but a little more than a year before she had been under observation for a pulmonary complication. This started with bilateral pain, dyspnœa, cough, and cyanosis, and showed scattered râles all over both sides, but on this condition clearing up an apparent consolidation at the left base was left, the respiratory-rate being only 20. It seems to me likely that this left base consolidation was of the same nature as that which killed her a year later, and that the acute generalised signs and symptoms were produced at the onset of the specific rheumatic inflammation by reason of the high pulmonary venous pressure.

There comes now the question as to why the consolidation should so commonly start at the left base and in mild cases be confined to the region. Dr. Robert Hutchison and Prof. Langmead have suggested to me that it is by direct spread from the pericardium, the rheumatic organism having a tendency to transgress anatomical boundaries and spread by contiguity. The former has stated in one paper[6] that he has never found the condition except in association with active pericarditis.

A consideration of my cases shows that an active pericarditis was not always present in association with the consolidation; three out of the six had none. This I think renders the spread theory unlikely. For some time I thought that the pressure of a large heart and the consequent partial collapse of the left lung must be the factor determining the preference for this situation, but consideration of the very different sizes of the hearts in the affected cases has made me abandon this supposition.

My present position is rather to make a suggestion than to state a theory. It is now a well-known fact that the rheumatic reaction processes are most likely to be found in positions exposed to friction. Subcutaneous nodules appear in just those positions where the skin is liable to be rubbed over bony surfaces, and vegetations on the valves usually appear in positions where there is most chafing. I would suggest, then, that the large and rapidly beating heart does, by its local massage of the left lung, make that small difference which determines the seat of election. At the same time I would point out that the acute cases do not show any special predilection for one side, and I think that a careful clinical study of the more chronic cases will show that there has been an exaggeration of the unilateral incidence produced in our minds, probably by the suggestive influence of the collapse theory.

One of the difficulties which must be faced is how with so massive a change in the lung the normal parenchyma can be restored. The answer to this is bound to be speculative, but the remarkable power these endothelial cells have of regenerating new blood cells supplies a hint. In the older books the association of pneumonia and pleurisy with rheumatism was considered to be quite a well-established fact. A. E. Garrod,[9] in 1890, wrote a "Treatise on Rheumatism," in which he devoted a chapter to "rheumatic pneumonia," quoted statistics from a number of earlier authors, and made some very acute observations. Rheumatism then, however, was probably more common in adults and more acute in its manifestation, and, although these observations have great interest and value, it is necessary to cover the ground again and correlate physical signs and symptoms with what we have since learnt of the specific pathology of the condition.

There are other subsidiary questions which my sections serve, I think, to settle. For instance, Letulle, Bezançon, and Weil[10] have advanced a theory that the large multinucleate cells of the Aschoff nodule are derived from the muscle cell of the heart. The sections from my cases go far to disprove this.

Summary.

1. A new type of pathological consolidation of the lungs is described. 2. This consolidation is associated with evidence of active rheumatism elsewhere in the body and usually in the heart. 3. Its most striking feature is an enormous endothelial proliferation, the cells apparently originating from the walls of the alveolar capillaries. 4. The reactive process appears to be identical with that described by Coombs as pathognomonic of rheumatic infection elsewhere, and its specific nature is even more striking. 5. The consolidation may spread through the lungs with great rapidity. 6. There is very little disturbance of the respiratory-rate and scarcely any respiratory distress until the consolidation is enormous. 7. If salicylate of soda is given the temperature is little, or not at all, raised. 8. This type of consolidation probably accounts for the patches of dullness met with at the left base in association with rheumatic carditis and hitherto attributed to collapse from pressure.

In conclusion I should like to express my thanks to Dr. C. D. Tingle, assistant pathologist at the Royal Hospital, for invaluable assistance; to my colleague, Prof. Arthur Hall, for so kindly allowing me to examine the slides of his case, and for his valuable help in other ways; and to the Librarian of the Royal Society of Medicine, who has been indefatigable in helping me to trace references.

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Clinical and Laboratory Notes.

A NEW METHOD OF ADMINISTERING HEAVY METALS.

WITH REFERENCE TO THE TREATMENT OF CANCER.

By J. Leon Jona, M.D. Melb., M.S. Adel.

(From the Physiological Laboratory, University of Melbourne.)

It sometimes happens that heavy metals given by the mouth either are not absorbed (cf. Bunge [1]) or produce irritation of the stomach or bowel. The consequent vomiting or diarrhœa causes the loss of a variable amount of the administered metal as well as general effects due to the gastro-intestinal disturbance. When the metals are injected subcutaneously or intramuscularly, local irritation or even death of tissue, with consequent inflammation, necrosis, or sloughing often results. When injected intravenously the metal is either (in all probability) combined with the proteins of the blood and then picked out by the liver and slowly excreted, or a violent effect on the heart or nervous system is produced by the sudden introduction of the toxic metal, and the recipient collapses or dies, according to the dose. So it occurred to the writer that the blood corpuscles might be utilised as a vehicle. Introduced metal-laden corpuscles break down at a steady rate, so that the metal is steadily liberated into the blood, probably as a colloidal compound, and picked out by those tissues having an affinity for it. That a metal so added to a corpuscle is apparently combined with or adsorbed to the envelope of the corpuscle can readily be seen by treating a smear preparation of corpuscles combined with lead, bismuth, copper, or mercury with a solution of sulphuretted hydrogen, when the red corpuscles show a black rim like the tyre of a wheel and the surface of the corpuscle is stippled or stained more or less uniformly black. The great surface-area of the corpuscles—about 600 sq. mm. in 1 c.mm. of blood—provides tremendous scope for medication. (See Tabulæ Biologicæ.[2])

The preliminary experiments were performed on dogs, cats, and human volunteers; the individual's own blood was drawn off into sodium citrate solution, the corpuscles were centrifuged off, washed, combined with the metal, washed twice or three times until the supernatant fluid was free of metal, and then reintroduced intravenously in a saline suspension. In later experiments the blood of one animal was used for preparing the corpuscle-metal combination which was injected into another animal of the same species. In a subsequent series sheep or ox blood preparations were injected into dogs, cats, rabbits, and human beings and were found to produce the same effects as autogenous blood corpuscles. This, of course, made experimentation easier, as it was possible to keep a large stock in an ice-chest and perform a regular series of experiments with a constant preparation.

The animal experiments showed that it was possible to administer intravenously in this way doses of lead, copper, mercury, and other metals three to five times as great as would kill the animal if they were introduced intravenously in ordinary solution under the same conditions. Latterly I have been using lead and bismuth combined in this way for inoperable cancer, but it is too early yet to speak of results.

The ease of preparation, constancy of composition, and stability of the preparation, when properly taken care of, contrast with the difficulty of preparation and preservation of the ordinary solutions of colloidal lead as used at present by Blair Bell and others in cancer work.[3] Various metals and metallic substances have been used, including copper, lead, zinc, mercury, gold, silver, and iodine.

The phenomenon is probably a surface effect of the nature of adsorption, or a specific combination of the metal with some constituent of the envelope of the corpuscle. This is indicated by the fact that the corpuscles take up most of the metal when small quantities are used. Copper was used in these experiments as copper-sulphate solution, and as the dose was increased relatively more and more copper sulphate remained in the supernatant fluid. Similar results were obtained with cupric chloride and with a solution of cupric cyanide in potassium cyanide solution. Owing to the high toxicity of the latter drug, much smaller doses were given and the amount of cupric cyanide in the supernatant fluid was much diminished. After the second washing there was no metal in the supernatant fluid.

Where lead and bismuth were together combined with the corpuscles for the treatment of cancer it was found that the preparation contained: bismuth 4·8 per cent. and lead 2·7 per cent., both lead and bismuth being estimated as metal. It was possible to give a dose which contained 0·24 g. of bismuth and 0·135 g. of lead, but the usual dose was one containing 0·2 g. of bismuth and 0·11 g. of lead. It was repeated every three or four days until three or four doses had been given, and then an interval was allowed.

In the original experiments on cancer in 1924 copper was used. Although life was probably not prolonged, it was made endurable, and in some cases the patient put on weight for a while and ultimately died after only about two weeks' illness without any of the usual wasting. At present bismuth and lead combined are being tried, and it is hoped shortly to have a series on copper and lead combined.

I wish to thank Prof. W. A. Osborne for the use of his laboratories, and Prof. E. Hartung for having carried out the chemical analyses for me.

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[1] Bunge, G. von: Physiological and Pathological Chemistry (translated by E. H. Starling), 1902, p. 371.

[2] Tabulæ Biologicæ (ed. W. Junk), by C. Oppenheimer and L. Pincussen, 1925, ii., 460.

[3] W. Blair Bell and co-workers: Brit. Med. Jour., 1926, ii., 924.

AN UNUSUAL CASE OF ACUTE INTESTINAL OBSTRUCTION.

By James Fanstone, M.D. Lond., D.T.M.,

and

Gerald Golden, M.B., B.S. Lond.

Fæcal impaction is mentioned in text-books of surgery as a cause of acute intestinal obstruction, but it is so rare at home that the description of the following case may be of interest. It is an extreme example of a disease which is quite common in the interior of Brazil—namely, an extraordinary sluggishness of the large bowel. An evacuation at intervals of ten days is considered no sufficient reason for seeking medical aid, while we have seen patients who have passed more than 40 days without action of the bowels.

The case is that of a married woman of 29, who was brought to us in September, 1926. She had not suffered from any serious illness previously, but for 12 years had complained of increasing irregularity of the bowels. Eighteen days before her arrival she had eaten enormous quantities of a fruit which resembles the grape, but has larger and harder stones. Since then she had had no action of the bowels, and had suffered much colicky abdominal pain.

On examination she was found to be five months pregnant with her first child. It was difficult to feel the uterus owing to the enormous abdominal distension, which was, however, most marked laterally. A huge fæcaloma occupied the entire descending and the left half of the transverse colon. Except at the proximal extremity, this mass was stony hard, and palpation caused much pain. A previous diagnosis had been made elsewhere of transverse presentation! It was impossible to feel the mass by rectal examination. There was no fever and the pulse-rate was 90. Two large enemas were administered but failed to produce either *fæces or flatus.*

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[illegible] between [illegible] found for the [illegible] mass seemed to be [illegible] colostomy was made [illegible] mucous colic. Just [illegible] weeks after operation [illegible] impacted mass by [illegible] Instead there [illegible] tenderness localised to [illegible] fever and emaciation. [illegible] months.

[illegible] without serious difficulty, [illegible] After labour the bowels [illegible] evacuation of hard masses, in [illegible] At this time about [illegible] came away, with temporary [illegible] No further evacuation occurred, [illegible] during the puerperium. The [illegible] and lasted about six [illegible] the lower abdomen was very [illegible] on the left side. Micturition [illegible] By vaginal examination, a [illegible] could be felt in the left fornix. [illegible] had subsided completely, the fæcal [illegible] rapidly evacuated by the introduction [illegible] of magnesium sulphate into the colostomy.

[illegible] the abdomen was reopened. The [illegible] was found to be only a few inches in [illegible] very hard and fibrous, and [illegible] adhesions to the body of the uterus. [illegible] stricture the descending colon was [illegible] dilated and somewhat hypertrophied. [illegible] reached the upper end of the rectum, [illegible] resection and anastomosis was out [illegible] question. The colostomy was therefore [illegible] and the free extremities anastomosed side [illegible] side. This was followed by a complete return to [illegible] The bowels continue to act regularly as a [illegible] of the copious daily use of magnesium sulphate.

[illegible] Brazil.

A NOTE ON

MULTIPLE SUPERFICIAL ULCERS OF THE SMALL INTESTINE.

By K. KANAGARAYER, L.M.S. SINGAPORE,
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AMONG ulcers of the small intestine, the single duodenal ulcer, the multiple typhoid ulcers of the ileum and lower alimentary tract, and tuberculous ulcerations have all been classified and descriptively labelled. In 3000 autopsies during the last four years I have found, in three cases, an ulceration of the small intestine which fails to conform to any of those three recognised types. As attention has been directed to a similar condition in a case reported by M. Scott and J. B. Cleland,[1] the post-mortem findings in these three cases are here briefly recorded.

Reports of Cases.

CASE 1.—On Jan. 26th, 1925, the body of a Tamil, said to have committed suicide by hanging, was brought to the District Hospital, Kuala Lumpur. Its condition suggested that a chronic wasting disease had driven him in desperation to take his life. At autopsy the only lesions were a series of superficial ulcerations in the small intestine extending from 1 inch from the duodeno-jejunal flexure to 4 feet from the ileocæcal junction. There were four or five ulcers in each foot of intestine, all running transversely, and the majority involving the entire circumference of the bowel. Some of them were quite narrow, others $\frac{1}{4}$–$\frac{3}{4}$ inch in diameter. The base was fairly smooth, and the edges only slightly raised. The peritoneal surface was not thickened in most cases, but a few showed slight puckering. In their distribution, serpiginous extension in the transverse axis of the bowel, and puckering of the peritoneal surface, they almost resembled tuberculous lesions, except that there was less puckering, edges and bases were less ragged, and tubercles on the peritoneal surface were absent. There was no evidence of tubercle in the abdomen or elsewhere. Smears made from scrapings of the bases and edges of ulcers, and of their peritoneal surface, showed no tubercle bacilli. Unfortunately, the ulcers were not histologically examined, but in view of the findings in the next two cases, it is probable that the histological picture would have been similar to that described below. A history of pain in abdomen and diarrhœa of four months' duration was obtained from the brother.

CASE 2.—On July 28th, 1927, a young male Tamil was admitted to the hospital with complaint of passing loose motions, five to seven times a day, without blood or mucus, for about a fortnight. He died on August 10th and autopsy revealed only nine small superficial ulcers in upper part of jejunum. A few ulcers were circular; but most of them were oval with their longer diameter in the transverse axis of bowel. The peritoneal surface of these ulcers was puckered. No protozoa or acid-fast bacilli were found in smears. Cultures yielded coliform organisms. The rest of the alimentary canal was normal, and no evident cause of death other than the ulcers was noted. The body was emaciated, and it is likely that the illness was of longer duration than indicated by the history. Sections of the ulcers showed chronic inflammatory changes with loss of the mucous and submucous coats.

CASE 3.—A Tamil, aged 30, was admitted to the hospital on June 19th, 1927, suffering from chronic urethritis, and progressive emaciation and diarrhœa. The Wassermann reaction was negative. Intestinal tuberculosis was suspected. He died on August 20th, and autopsy revealed transverse ulcerations along the whole length of the small intestine extending from the lower third of the duodenum to 2 feet from the ileocæcal junction, with four to five ulcers in each foot of intestine. The description already given to those in Case 1 applies equally to these. Sections showed no histological evidence of tuberculous condition. There was loss of mucous and submucous coats and evidence of chronic inflammation.

These three cases present an unusual type of ulceration of the small intestine. The ulcers were superficial and showed a tendency to healing and scarring. No explanation of the genesis of these ulcers can at present be given. So rare is the condition that a diagnosis antemortem must be extremely difficult. Radiographic examination of the small intestine might help in diagnosis. The anatomical resemblance to tuberculous lesion suggests that the ulceration extends transversely round the gut by following the course of lymphatics and blood-vessels; but the lymphoid nodules do not appear to be involved, as they are in typhoid and tuberculous ulcers.

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[1] Medical Journal of Australia, 1927, i., 718.

DONATIONS AND BEQUESTS.—Sir Henry James Hall, Gloverswood, Charlwood, Surrey, left £1000 to St. Dunstan's Hospital for Blinded Sailors and Soldiers, and £500 to the London Association for the Blind.—Mr. Frank Sussum, of Cambridge, left £1000 to Addenbrooke's Hospital, Cambridge.—Mr. Ramsay Paxton, of Sunderland, left £700 each to Sunderland Infirmary and Sunderland Orphan Asylum.—Among other bequests Mr. F. L. Heyn, J.P., of Craigavad, County Down, left £1000 to the Royal Victoria Hospital, Belfast, to name two beds, one to be called the "Frederick L. Heyn and Helen B. Heyn Bed," and the other the "F. L. Heyn Head Line of Steamers Bed"; £250 to the Belfast Maternity Hospital; £250 to the Society for Providing Nurses for the Sick Poor of Belfast; £200 each to the Samaritan Hospital, Belfast, and the Ulster Hospital for Women and Children, Belfast.—Under the will of Sir Edwin Evans, J.P., of Battersea, the Bolingbroke Hospital, Wandsworth Common, S.W., will receive £1000 for general purposes and the Battersea General Hospital and the Royal Blind Pension Society of the United Kingdom £250 each.—Mr. Samuel Kidd, of Derby-road, Farnworth, near Widnes, left £1000 each to the School for the Blind, Hardman-street, Liverpool, the Royal Infirmary, Liverpool, the Eye and Ear Infirmary, Liverpool, and the Ethel Gossage Home, Farnworth Branch.—Mr. Matthew Turbitt, of Birkdale, Southport, left £1000 stock to the Southport Infirmary and, subject to a life interest, £1000 each to the Imperial Cancer Research Fund, Dr. Barnardo's Homes, the Church Army, the National Lifeboat Institution, and the North of England Children's Sanatorium at Southport. After other bequests the ultimate residue of the property will be divided between St. Dunstan's Hostel for the Blind, King George's Fund for Sailors, the Society for the Prevention of Cruelty to Children, the Royal Association in Aid of the Deaf and Dumb, the Southport and District Deaf and Dumb Mission, and the Southport and Birkdale Provident Society.

Reviews and Notices of Books.

SIMPLE GOITRES.

By R. McCARRISON, C.I.E., M.D., D.Sc., LL.D., F.R.C.P., Associate Fellow de l'Académie de Médecine, Paris; Lieut.-Colonel, I.M.S.; Pasteur Institute, Coonor, S. India. London: Baillière, Tindall and Cox. 1928. Pp. 106. 15s.

THE subject matter of a report by Colonel McCarrison to the International Conference on Goitre held at Berne in August, 1927, has been published in the form of a monograph and has been amplified by an introduction. A series of 143 excellent illustrations follow the report, and, if studied in the order in which they are arranged, tell their own story of the genesis of simple goitres. Three types are discussed: the adeno-parenchymatous or chronic hypertrophic goitre, the diffuse colloid type, and the lymphadenoid type. The similarity of these three goitres is confined to the thyroid swelling which is manifest in them all, even as the exanthemata have in common only the pyrexia which is their most prominent symptom. The adeno-parenchymatous and diffuse colloid goitres are endemic types and differ in their epidemiology, ætiology, and pathology; both may occur sporadically. Adeno-parenchymatous goitre occurs in mountainous regions, the diffuse colloid goitre in lowland regions and at or near the sea coast. Their geographical limits may overlap and they may occur together in the same locality. The first-named type is considered to be a true hypertrophy with the thyroid constantly straining to satisfy the needs of the tissues for its active principles but just falling short of doing so. Sufferers generally show evidence of hypothyroidism. This is essentially a place disease, and from time immemorial has been associated in its origin with water-supply. Two theories as to its causation have survived from amongst many promulgated, the iodine deficiency theory and the infectious or toxic theory. Colonel McCarrison is of the opinion that the truth may lie in a blend of the two, but it is rather difficult to see how such different conceptions could be made to overlap.

We have little precise knowledge as to the geographical distribution, epidemiology, ætiology, and biochemistry of diffuse colloid goitre. Its cause is probably to be sought in factors which interrupt the normal cycle of the thyroid gland's activity at the stage of colloid storage. It is most prevalent in children round about the age of puberty, and it progresses with remissions for from three to five years and then regresses. Iodine may play some part in its production, but is not the only factor involved. Thyroxin given by the mouth may have no effect, but the same drug administered intravenously rarely fails to cure the condition. The lymphadenoid type of goitre is not endemic. It is a hypertrophic reaction of a physiologically insufficient organ, with which is associated a preponderance of lymphocytic aggregates and fibrosis in the gland. It can be produced experimentally in rats by dietetic deficiency. McCarrison considers that the basal factor in the causation of this type of goitre in man also is a diet deficient in vitamins of the A, B, and C classes. This, however, has still to be proved. He considers that it is not related to iodine deficiency since the addition of iodine to the food neither prevents nor cures it.

This monograph will be of considerable value to those interested in thyroid disease, especially in that it directs attention to the importance of toxic and dietetic factors in the genesis of these conditions. It should also do something to counteract the modern tendency to the indiscriminate use of iodine in the prophylaxis and treatment of all forms of simple goitre.

THE SPECIES PROBLEM.

By G. C. ROBSON. Edinburgh: Oliver and Boyd. 1928. Pp. 283. 15s.

THE Keeper of the Mollusca at the British Museum has written an interesting and suggestive book. The first part discusses the criteria on which "species" of animals and plants may be separated from one another and represents well the modern point of view that habits, food, and such physiological characters must be taken into account equally with morphological structure. A species is a species not so much because it has a unique anatomy, but because it occupies a unique niche in its relations to the rest of animate nature. The second, and larger part, discusses the evolutionary divergence of species, and explores the various suggestions which have been made in the light of all the knowledge which has accumulated since Darwin. It is stimulating and provocative and reaches no conclusions. There is a useful bibliography and a poor index.

ENDOCRINOLOGY.

Internal Secretions and Metabolism in Infancy and Childhood. By FRITZ B. TALBOT, A.B., M.D., Clinical Professor of Pediatrics, Harvard Medical School. Supervising editor: R. S. HAYNES, Ph.B., M.D., Clinical Professor of Diseases of Children, College of Physicians and Surgeons (Columbia University), N.Y. London and New York: D. Appleton and Co. 1928. Pp. 178. 16s.

THIS is the thirteenth volume of a series of monographs on clinical pediatrics which are written primarily for the general practitioner. Both the authors are men of great experience in this subject and the work is authoritative. The purpose of the volume is to outline in simple terms those fundamental principles of metabolism which form the basis of modern clinical medicine. Twenty years ago most students were taught that medical therapy was based principally upon clinical observations, bacteriology, and post-mortem examinations. They learnt in great detail the symptoms and signs of the various diseases of nutrition and the lesions which were characteristically produced by each disease, but they knew very little about the abnormal physiology associated with the different syndromes. In the last two decades, however, physiologists and chemists have so increased our knowledge of the normal and abnormal functions of the body that our conception of disease has been greatly modified. The authors of this monograph have considered the subject from the most modern standpoint and have included an account of recent experimental work. The work is divided into five chapters. In the first of these the fundamental metabolic processes of childhood are fully discussed, and much useful information is given about the normal variations both of metabolism and growth which serve as standards of comparison in the following sections. In the second chapter pathological variations in metabolism are dealt with: a clear account is given of acidosis and alkalosis. An outline of ductless gland dystrophies is set out in the third chapter, only such data being included as have a definite experimental basis. The fourth chapter gives a description of the deficiency diseases of childhood, notably rickets and scurvy, while the fifth is devoted to such abnormalities of growth and development as infantilism, mongolism, and obesity. Many useful hints as to the treatment of these various conditions are incorporated. An excellent series of diagrams and photographs will be useful in helping the practitioner in differential diagnosis: the X ray photographs illustrating the various bone diseases are particularly good. The monograph can be cordially recommended.

Hormone und Inner Sekretion. By Dr. FRITZ LAQUER, Privatdozent an der Universitat Frankfurt A.M. Dresden und Leipzig: Verlag von Theodor Steinkopff. 1928. Pp. 136. M.8.50.

THE rapidity with which masses of facts and observations accumulate in the literature of internal secretions makes it difficult for one observer to follow even a limited aspect of the subject. Any attempt to verify all the results of the enormous number of workers in this field is out of the question, and each worker can only try to correlate his own findings with those of *well-accredited laboratories*. Dr. Laquer has gathered together much of the literature of hormones and internal secretions which has grown during the last 12 years; over 1200 references have been collected. He makes little effort to supply a critical survey: in the matter of physiological explanations of the actions of different hormones the reader is at liberty to choose whatever theory pleases him most without much guidance. With regard to clinical data, however, the results obtained by serious workers of different nationalities are substantially the same. The active hormones produce effects which vary only in degree in the hands of different observers. When physiologists and biochemists attempt to explain the modus operandi of the hormones the most diverse opinions are offered, and fundamental disagreement still exists.

Dr. Laquer does not attempt to resolve these differences, and his book will be of value to the research worker in that the literature is clearly summarised and references are given to articles in the less well-known special journals which may have escaped attention.

The Great Problem and the Evidence for its Solution.

By George Lindsay Johnson, M.A., B.C., M.D., F.R.C.S., F.R.P.S., F.R.S. Italy. With a Foreword by Sir A. Conan Doyle. London: Hutchison and Co. 1928. Pp. 380. 18s.

Public interest in spiritualism—a general name for the phenomena whose study constitutes "the great problem" attacked by Mr. George Lindsay Johnson—is reflected in the lay press and in a profuse literature which sometimes appears associated with the name or under the imprimatur of persons whose qualifications should give authority to their opinions. The object of Mr. Johnson's work, which has received the euology of Sir Arthur Conan Doyle, is "to collect all the evidence at our command, and to endeavour to convince the reader of the existence of a future life." The first part of the proposition is fulfilled by the collection and collation of a vast assortment of dreams and stories of apparitions, examples of clairvoyance and telepathy, spirit vocalisations and photography, and automatic writing; past and present beliefs and traditions being put under contribution, we have an index of proper names occupying more than 800 lines. In a chapter headed "Evidence of a future life from the miracles of the Bible, together with modern phenomena of a similar nature," many unusual cases of recovery from illness are given, but it is difficult to understand how the occurrence of healing, apparently brought about by mental processes, can be used as evidence of survival in any partly materialised form, and it is doubtful whether anyone, unless he is already a confirmed believer in spirit interference, will be impressed by the reasoning. Endeavouring to explain certain difficulties of the non-believer in spiritualism the author replies to his question, ". . . Why is it that everybody cannot get into touch with their friends on the other side?" by saying that "The reason is quite simple. In order to receive messages from the spirit world it is essential that a psychic or medium be present"; here, again, none but the converted will be satisfied with the answer. As an example of painstaking research in collecting stories of the "marvellous" the book is interesting, while at the same time it exhibits the kind of proof on which belief in so-called survival is based.

Even if the phenomena of the séance room, and the stories of supernormal occurrences be accepted, it does not follow that they are to be explained by spiritualistic agency, while there can be no denial that the belief in the sequence has opened the door to deception, sometimes of the most gross kind. It is necessary to glance only at the advertisements of some of the publications connected with the spiritualistic movement to realise this. In juxtaposition with announcements of services in "*temples*," "sanctuaries," and "churches," we have announcements from palmists, astrologists, and fortune-tellers, seductively brought before the public eye, while the vendors of unknown powers of diagnosis, of cures for consumption and cancer, of "female corrective herbs," of electric treatments, and galvanic belts, find a large public through these media, to judge by the amount of space which some of the advertisers are able to afford. Such being the associations of spiritualism as shown by its recognised press, the answer is supplied to the frequently reiterated complaint by spiritualists that their cult is ignored or ridiculed by science.

Clinical Diagnosis by Laboratory Methods.

Sixth edition. By James Campbell Todd, Ph.B., M.D., Professor of Clinical Pathology, University of Colorado School of Medicine; and Arthur Hawley Sanford, A.M., M.D., Professor of Clinical Pathology, University of Minnesota. London and Philadelphia: W. B. Saunders Company. 1927. Pp. 748. 28s.

"Todd" has long been known in this country, and "Todd and Sanford" is assured of an equal popularity. This is a book which is of particular value to the student, for the number and the excellence of the illustrations, the clarity of the language, and the short, but concise, notes on the indications for the applications of various tests and the interpretation of the results. The present edition has been brought thoroughly up to date, and all new procedures of clinical pathology as deserving admission, such as the Kahn test, the technique of duodenal intubation, and the tests of liver function, find place in its pages. Altogether, an excellent book.

Micro-Methods.

Mikromethodik. Quantitative Bestimmung der Harn-, Blut- und Organbestandteile in kleinen Mengen für klinische und experimentelle Zwecke. By Ludwig Pincussen, Direktor der biochemischen Abteilung des Städt. Krankenhauses am Urban in Berlin. Leipzig: Georg Thieme. 1928. Pp. 200. M.6.

This book, which now appears in its fourth edition, has been enlarged and improved. Opening with sections on general principles on the use of the colorimeter and on nephelometric methods, the author proceeds to give full experimental details for the determination of the constituents of urine and blood by approved micro-methods, many of which have been elaborated or improved by himself. In addition there are sections devoted to the estimation of the ash constituents of fæces or of tissues, and to the gasometric examination of blood by means of a modified Barcroft method. The book is clearly written and forms a handy compendium of micro-methods, suitable for clinical or experimental purposes, which can be carried out without the acquisition of elaborate apparatus or the use of a micro-balance.

To-day and To-morrow.

Metanthropos, or the Body of the Future. By Ronald Campbell Macfie, M.A., M.B., C.M., LL.D. London: Kegan Paul, Trench, Trübner and Co., Ltd. New York: E. P. Dutton and Co. 1928. Pp. 96. 2*s.* 6*d.*

Dr. Campbell Macfie adds a volume to the well-known To-day and To-morrow Series which should certainly be read by a large public, for the number of persons now intelligently interested both in anthropology and physiology is very large. We may conceive that the last and most important chapter of this little book will irritate many of these, and some of the general deductions may be challenged, but despite the drastic commentary upon one side of society contained in the following passage, the author's message is cheerful. "If love," he writes, "in the sense of strong physical and spiritual attraction between a man and a woman, have even temporarily weakened; if men no longer are drawn to women by their health—by their full breasts, and luxuriant hair, and well-formed limbs, and red lips, and fresh complexions, and feminine psychology—if nowadays women are so camouflaged with paint and powder and so attenuated by the decrees of fashion that there is little possibility of distinguishing the healthy and wholesome from the unhealthy and unwholesome—if men have grown so accustomed to paint and powder as to lose the love of the healthy and fresh—if sexual selection is no longer eugenic and no longer a matter of deep personal affinity—if men and women through modern dances and plays become sexually blasés—if the best men and women marry late and have small families—if religion and morality are out of fashion—if these things are so and in so far as they are so, the race is suffering and must suffer for perhaps more than one generation." These Juvenalia epitomise much which the author has to say, but none the less he comes to the conclusion that the majority of men and women are not yet touched by decadence and that the Anglo-Saxon stock with its mixture of Nordic and Celtic blood is so stable and so good that there is no fear of any lasting deterioration.

PHYSIOLOGY AND MEDICINE.

Pathological Physiology of Internal Diseases: Functional Pathology. Fourth edition (revised). By A. W. HEWLETT, M.D., B.S. late Professor of Medicine, Stanford Medical School. London and New York: D. Appleton and Co. 1928. Pp. 787. 35s.

THE advances in recent years of experimental physiology and particularly of mammalian physiology have thrown new light on the causation of disease and furnished new lines of treatment. Moreover, physiology has brought new methods of diagnosis to the clinical laboratory. The benefit has not been wholly one-sided, but attempts to correlate medicine and physiology in text-books have for the most part dwelt on the debt of medicine to physiology. This work is no exception. It was originally written by the late Dr. A. W. Hewlett, who began his medical career as a physiologist, later becoming a professor of clinical medicine, and it has recently received extensive revision, as a mark of appreciation to the author by ten of his medical colleagues. The book, in its present form, makes a special appeal to clinicians. Historical references are scanty, but a generous bibliography is supplied. Certain of the views on immunity here set out are already superseded, at least in this country, in favour of physico-chemical hypotheses, but, in general, the book may be accepted as quite up to date.

Précis de Physiologie. Seventh edition. By MAURICE ARTHUS, Professor of Physiology at the University of Lausanne. Paris: Masson et Cie. 1928. Pp. 1152. Fr.70.

A TEXT-BOOK of a thousand pages is not the prevailing notion of a précis, but evidently the bulk of this volume has not deterred medical students from buying it, since it has attained a seventh edition. The work differs in three respects from text-books of similar size in our language. It is more narrowly confined to the exposition of function, the author expressly avoiding the discussion of physiology from the point of view of physics and chemistry. Experimental technique is not described; for example, "tambours" appear in diagrams where "piston recorders" would be used in this country. Lastly, when results of recent researches are still controversial, these are omitted; these omissions may save the student's time but, we believe, only at the expense of loss of stimulation. More prominence is given to the medical standpoint than is usual in our text-books; thus, body temperature—a subject of great clinical importance—is fully discussed. A useful chapter is included on anæsthesia. British readers will find much of interest in this book.

THE PRINCIPLES OF INFANT NUTRITION.

By K. H. TALLERMAN, M.D., M.R.C.P., and C. K. J. HAMILTON, B.M., M.R.C.P. London: William Heinemann, Ltd. 1928. Pp. 183. 10s.

THE object of this book is to discuss the principles underlying infant nutrition, and to point out their application to the practice of infant feeding rather than to advocate any particular method. The authors have succeeded in giving a readable presentation of the physiology and biochemistry of nutrition in infancy. The relative advantages of various methods of feeding are discussed with impartiality, but the authors' interpretation of physiological theories disposes them to give preference to simple modifications of milk with added carbohydrate and low fat-content. Whole milk feeding is discouraged; percentage feeding is regarded as unnecessary. The reason for these judgments, which are probably in accord with the views of the majority of authorities in this country, are clearly explained. The authors are opposed to the use of citrate and of alkalis in general, and are convinced of the advantages of acid milks. The book is of convenient size, and each chapter contains a useful list of references. It may be recommended for the use of senior students and of practitioners who wish to obtain a concise account of modern teaching.

PSYCHE MINIATURES.

A Symposium of Culture. By G. ELLIOT SMITH, D.Sc., Professor of Anatomy in the University of London; BRONISLAW MALINOWSKI, D.Sc., Professor of Anthropology in the University of London; HERBERT J. SPINDEN, Ph.D., Peabody Museum, Harvard University; and A. GOLDENWEISER, Ph.D. Pp. 89.

The Alchemy of Light and Colour. By OLIVER L. REISER, Assistant Professor of Philosophy in the University of Pittsburg. Pp. 86.

Intelligence and Mental Growth. By CLAUDE A. CLAREMONT, B.Sc. Lond. Pp. 138.

The Standardisation of Error. By VILHJMUR STEFANSSON, M.A., LL.D. Pp. 110.

London: Kegan Paul, Trench, Trübner and Co., Ltd. 1928. 2s. 6d. each.

As will be seen from the above titles a large range of knowledge is covered in these four little books of the Psyche Miniature Series, and it is given in so brief a form that further condensation as a review is impossible. The Symposium of Culture, for example, may be regarded as the abstract of a review of its own subject from four different angles of view, a lucid preamble by Prof. Elliot Smith setting out the controversial points in respect of the diffusion of social knowledge. Prof. Reiser, in discussing the phenomenon of colour, shows how the ingenuity of the scientist in overcoming limitations has brought about the position that no one *can predict* what the future may hold in store. Starting with the difficulties which have always presented themselves to the ordinary observer confronted with the differing views which the psychologist may hold in respect of colour as an attribute, or as an element in consciousness, he discusses the chemical and biochemical bases of colour and closes with a section, not at all easy to follow, in which he attempts to bring out the nature of the interdependence between consciousness and chemistry. Mr. Claremont's little book makes far simpler reading, partly because a well-written preamble prepares us for the chapters which follow, and partly because he has a real gift for illustrating his thesis by simple analogies. The chapter on intelligence and instinct forms a good example of his ability to state in clear language exactly what he means, and no one can read it without acquiring a valuable lesson in what may be termed psychological grammar.

Dr. Stefansson is gay; the following sentences with which the second part of his little book commences gives a good idea of his respect or disrespect for the discernment of the public. "The most striking contradiction of our civilisation is the fundamental reverence for truth which we profess and the thorough-going disregard for it which we practise. . . . God and truth have from the earliest times been the two ideas that have commanded the greatest reverence' . . . philosophers have discussed at great length whether God is good, they have never discussed whether truth is good." Whereupon the author starts to ask if there be any sound reason why truth should be exempted from that fundamental scrutiny to which even the gods have had to submit. It is, of course, obvious that the same question may be asked of the same people and receive entirely different replies, each of which may be true, the variants being due to the fact that the answers have been given in accordance with the varying implications contained in the question, although not put into words. On this ground, by itself, we may agree with the author that, like religion, truth is neither good nor bad; but the examples which he adduces in order to come to the conclusion make very agreeable reading.

MEDICAL AND ALLIED TOPICS IN LATIN POETRY.

By HENRICH OPPENHEIMER, D.Lit., LL.D., Ph.D. Lond., M.D. Heidelberg, M.R.C.P. Lond., Barrister-at-Law. London: John Bale, Sons and Danielsson. 1928. Pp. 445.

IN a sad little preface Dr. Oppenheimer gives as the origin of this book a certain enforced leisure which fell upon him during the period of the war owing to his unlucky position as an enemy alien—in his own words "an innocent victim of social and '*horribile dictu*' to some extent of professional ostracism." Accordingly, the author sought and found comfort in the company of the classical writers, and the result is an interesting collection of passages, contained in some 20 well-known Latin poets, all being relevant to medical knowledge. These passages he has arranged according to their subject matter, providing explanatory notes and English translations, some of which are quite familiar. Where the versions are metrical he gives the correct attributions, but with regard to both English and Latin texts he admits occasionally having taken certain liberties, when a variant reading seemed to bring out better the significance of a passage; as the exact alterations made are not indicated this seems rather a daring proceeding. As might be expected, the majority of the quotations come from well-known authors of the last century B.C. and the first 60 years of the Christian era, a period which includes Lucretius, Virgil, Ovid, Horace, Catullus, Martial, and Juvenal—the quotations from the last four being extremely numerous. The two older playwrights, Plautus and Terence, are also freely drawn upon, and all the passages extracted from this wide range of reading are arranged under a subject-index, so that citations having reference to medicine, surgery, and obstetrics are grouped together, while separate sections are devoted to various special diseases, to biology and physiology generally, to sociology, materia medica and toxicology, neurology, insanity, and dietetics. The result is a really interesting book, which although in no sense a medical history, none the less throws a remarkable light upon the medical practice and medical superstitions of the past, especially upon those of imperial Rome. An interesting little chapter, entitled the Medical Register of Poets, gives an alphabetical list of the physicians who are mentioned by name in the works of the various authors consulted, and by this register we are reminded how frequently was the medical profession the object of Martial's biting criticisms.

JOURNALS.

ACTA PÆDIATRICA. Vol. VII., 1928.—Supplement 2 comprises the proceedings of the Fourth Scandinavian Pædiatric Congress. Prof. S. Monrad reviews the subject of congenital pyloric stenosis from his experience of 223 cases. He holds that the essential defect is a congenital hypertrophy and that this is not secondary to spasm. He has found medical treatment as efficacious as surgical.—Dr. H. von Willebrand favours operative treatment of pylorospasm in all but the mildest cases.—Dr. L. Kena-Apajalahti gives an account of the histological appearances of the brain of a cretin child. These were of the nature of an agenesis rather than a failure of subsequent development, and corresponded closely to what is found in simple primary amentia. He suggests that the cerebral defect in cretinism is primary, i.e., an accompaniment rather than a result of athyroidism.—Prof. A. Yllpö discusses the relative merits of carbohydrate and protein feeding in the treatment of infantile intoxications, and expresses his decided preference for the latter.—In a paper by Dr. O. Utter attention is drawn to the frequency with which an alimentary saccharosuria, in the absence of glycosuria, occurs in infants. The increasing tendency to use cane sugar in the artificial feeding of infants gives added importance to this occurrence. He summarises the results of his investigations on the various factors (concentration, alkalinity, and fat content of the feeds) which seem to influence the excretion of saccharose.—Dr. A. Lichtenstein discusses the ætiology of scarlet fever, and the immunity of the new-born to this infection. He considers that the evidence afforded by this immunity is compatible with the view that scarlet fever is a manifestation of anaphylaxis.—Prof. E. Bloch describes the clinical features of a series of cases of cœliac disease. He was unable to find in them any evidence of avitaminosis. Two of his cases showed typical tetany; ultra-violet irradiation cured the latter but aggravated the intestinal disturbance. He suggests that in this disease tetany may be the result of fixation of calcium by the soaps formed in the stools.—Dr. C. Friderichsen gives an account of a series of cases in which intractable and fairly localised muscular pains occurred, with some degree of paresis. Some of the cases were children in the third year, and in them the symptoms gave rise to suspicion of muscular "growing pains." In all of them there eventually appeared some evidence, clear or equivocal, of a scorbutic condition. Taken in conjunction with the histological changes found by Höjer in experimental scurvy in guinea-pigs, he suggests that these observations yield evidence of a "pre-scorbutic myopathy," which may be present in a latent stage of scurvy and may simulate subacute rheumatism.—Dr. Knut Wejdling discussed some of the factors in the pathogenesis of spasmophilia. He thinks that the most important one is the electrostatic condition of the tissues, and believes that estimation of the potassium content of the blood is of greater value than the calcium content.

Supplement 3 consists of a monograph by Dr. C. W. Herlitz on the regulation of the blood-sugar in healthy infants and in those who exhibit signs of the exudative diathesis, particularly of eczema. Series of experiments are described and their interpretation is discussed at length. Among other conclusions reached are the following. In infants with fresh cutaneous eruptions of less than two weeks' duration the fasting blood-sugar value was higher than in normal infants or in those with long-standing eruptions; the alimentary blood-sugar curve reached a higher maximum but its return to the normal was not delayed. The increase in tone of the vegetative system—particularly in the liver—which is associated with the alteration in carbohydrate metabolism he regards as the result, and not the cause, of the cutaneous eruption.

THE LANCET.

ONDON: SATURDAY, JULY 7, 1928.

LOCAL GOVERNMENT REFORM.

changes, affecting the health services of local rities throughout the country, flow from the als in this year's budget for revising the ice of rates upon agriculture and industry. s easily realised that the Chancellor of the quer could not exempt agricultural land and ltural buildings from rates and could not grant e relief to industrial hereditaments without ting from the national finances some com- ion for the loss of rating power which the local ities would feel. But it could hardly have so readily foreseen that the revision of the al relations between the Exchequer and the thorities would involve the decision to transfer ovisionally proposed in 1926) all poor-law ns to the county councils and county boroughs. as, of course, been long admitted that the poor-law unions, set up in 1834 under a based on the local market towns and the xisting means of access thereto, have ceased m the ideal arrangement—at any rate, for l purposes. As the Government's white (Cmd. 3134) points out, at present every rural n the country has institutions which, with the in the number of persons institutionally d in rural areas, are seldom kept full. Their es for medical treatment cannot economically dernised. Meanwhile other local authorities been established which are charged with the oth of preventing disease and of treating the Between the functions of these newer authorities ose of the poor-law guardians there is over- g. If and when the poor-law is transferred he guardians to the county and county borough ils, there will be a chance to eliminate this pping, to make a better classification of the and to provide more economically the institu- l facilities for which the demand is progressively sing. In its application to London the new means the abolition of the Metropolitan m Board and the transfer to the London County cil of the services which the Board at present tains. The cost of poor relief being spread over County of London through, the county rate, etropolitan Common Poor Fund (the cause of uch political controversy and the object of so improvisation in recent years) will also be hed.

ong the existing Exchequer grants which the plan will discontinue all over the country are percentage grants in aid of health services— or tuberculosis, maternity and child welfare, e of the blind, venereal diseases, and mental ncy. When local authorities no longer receive grants, a new annual grant in aid of revenue e substituted for the first quinquennial period. ormulæ of ascertainment and apportionment tricate and will require careful examination ose who possess the necessary actuarial qualifi- s. In broad outline the Government plan l help the poorest areas which, under the per- e grant system, could least afford to maintain lequate standard and yet received the least assistance from national funds. Thus the rating relief, which the Government claims to be giving to productive industry by this year's budget, is found to be merely one step in big changes in the machinery and finance of local government. The programme appears to be far-sighted and shows evidence of a logical coördination which has not always been a feature of changes in English administration.

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THE CONTROL OF DIPHTHERIA.

When Behring made his famous experiments on passive immunity he was lucky enough to choose one of the few organisms which arouse great antitoxic powers in the blood of inoculated animals. His results in the treatment of diphtheria were therefore remarkable—so remarkable as to encourage a hope that all bacterial infections would meet their match in the new curative sera. Certainly there seemed no doubt that diphtheria was conquered, since by effective treatment of every case the spread of the disease must necessarily be checked. But with the passing years these hopes have not been realised, and the revolution in therapeutic measures has by no means abolished the necessity of using them. The incidence of diphtheria not only remains high, but, in London, has for many years been steadily rising, whilst the case-mortality has shown an alarming increase in Germany and other countries where serum treatment has long been employed as a routine. Much of this failure is, of course, due to delays before the remedy is administered, but as medical men have been taught for a generation that early treatment is essential, and the public has been informed incessantly of the need for early diagnosis, little immediate improvement can be expected in this direction. We cannot avoid the conclusion that current methods will not further reduce the mortality among serious cases, and that merely curative measures are not going to control the incidence of the disease by themselves.

Both in the United States of America and in Germany the greater prevalence of diphtheria has been associated with unusual malignancy. The symptoms include glandular enlargement and periglandular œdema with foul-smelling faucial deposits and discharge from the nose and throat, and there is commonly severe toxæmia, cardiac paralysis, renal failure, and early death. Fatalities, it is recorded, have occurred despite administration of antitoxin even within the first 24 hours, and this absence of the usual response to treatment has sometimes suggested that the clinical condition was dominated by a secondary streptococcal infection. Successes have been reported from the combined use of antidiphtheritic and antistreptococcal serum, but its efficacy as a routine measure is still in dispute. Although we in this country have enjoyed relative freedom from severe infections of the kind, experience of the malignant form has been recorded in certain towns; in Bristol, for example, Dr. D. S. Davies, the late medical officer of health, reported that the years 1919 to 1926 were characterised by an increase in the severity of the disease. Dr. H. S. Banks, of the Leicester Isolation Hospital, says that in the past two years diphtheria has taken on a more malignant form than he has ever previously encountered, and this has led him to explore the possibilities of more intensive treatment. As he and Dr. George McCracken record, in a paper published elsewhere in this issue, their cases were divided into groups according to severity, and the 27 regarded as "malignant," having severe adenitis, were treated with very large amounts of antitoxin. One had as much as 140,000 units in one dose, and the average quantity given was 71,000 units of antitoxin intravenously, with 31,000 units by intramuscular injection. Fifty-two cases whose infection was not quite so severe were given, on the average, 19,000 units by each route, whilst the remaining 214, of only moderate severity, had an ordinary intramuscular dose of 8000 to 16,000 units. The details of technique are set out in their communication and need not be considered further here; it is enough to say that the advantage claimed for the intravenous route is the rapidity with which maximal concentration of serum in the circulation is obtained, contrasting with a delay of 24 hours with intramuscular and three days with subcutaneous injection. BANKS and MCCRACKEN rightly describe toxic diphtheria as an acute emergency, and consider that to give a "haphazard subcutaneous injection of serum" is equivalent to postponing operation on a gangrenous appendix for three days. The total doses, which rose to 200,000 units in some cases, are not, of course, unprecedented. V. BIE, of Copenhagen, is quoted as having used as much as 300,000 units in very grave cases. They are, however, far greater than those in general use by the profession, or previously employed at the hospital, where it is noteworthy that the case-mortality has been reduced from 9·3 per cent. in the preceding decennium to 2·6 per cent. in the year ending last March. Excluding patients who died within 24 hours of admission, and those with laryngeal diphtheria, it was only 1·7 per cent., which is much the same as the death-rate of 1·3 per cent. in a series of 1456 cases treated last year by BIE. It is further stated that the incidence of complications, notably paralysis, has also diminished, and these results are so remarkable that they must lead to reconsideration of the current view that it is useless to give antidiphtheritic serum in doses of more than 30,000 to 50,000 units.

More successful use of antitoxin would not be likely, however, to make much difference to the incidence of the disease, and the question arises whether the best use is being made of the prophylactic methods at our disposal. The answer is in the negative. In this country the progress of toxoid-antitoxin immunisation, though steady, is slow, first because the profession has apparently not been convinced that the method is effective and, secondly, because the public is suspicious of inoculations and disturbed by the disasters of Vienna and Bundaberg. Last year's increase of diphtheria in New York, where immunisation has been tried on a large scale, may lead to disparagement of the method, and it is certainly disappointing. But it must be remembered that the city has a population of 1½ million children under the age of 15, only about a third of whom have been immunised; the remaining unprotected million, —mainly children of pre-school age—offer an abundance of material susceptible to attack during a period of increased prevalence. In Germany the Prussian Health Council has recommended widespread prophylactic inoculation among children in districts with a high incidence of diphtheria, and in Berlin immunisation is being provided free for all children between the ages of one and six years. We are glad to learn that more and more local authorities in this country are offering similar facilities. Thus, at Manchester, the City Council has just approved a scheme by which for six months toxoid-antitoxin will be issued gratis to practitioners and health officers, and immunisation will be recommended to the public through every possible avenue. Information is to be offered at maternity and child welfare centres, at the various children's hospitals, and by way of the school medical service, as is being done in some of the London boroughs, 12 of which now provide means of protection by toxoid-antitoxin inoculation. It is regrettable that schemes of this kind are not being tried more widely, if only on economic grounds; for the sum of £30, which is what a diphtheritic child costs London, would protect 200 children against the disease. The safety of the procedure is actually thrown into relief by the two or three disasters that have occurred abroad, for they would not have been possible with the immunising preparations obtainable from reputable sources in this country. As Dr. VEITCH CLARK told the Manchester City Council, we have the evidence of many large fever hospitals that diphtheria among the nursing staff has been stamped out by the immunisation of nurses before their exposure to diphtheria in the wards, and no accidents following immunisation have been reported in Great Britain. The method may not be infallible but it is certainly safe, and, to quote the London County Council's health committee, "According to authoritative American observers, as a result of observation over periods ranging from three to six years, no child who received the full immunising course, and had given a Schick-negative reaction, subsequently contracted diphtheria." The profession in this country may wish for evidence from sources nearer home, but such evidence on a large scale can scarcely be available until the method is given wider use. The case in its favour is already so good that parents ought to be given a chance of protecting their children if they are willing to do so. Not least ought this opportunity to be given in London and other large cities, where the incidence and mortality of diphtheria are high.

CONCURRENT EVOLUTION.

THERE has been a revival of the public interest in the problems of evolution, particularly in so far as they affect our conception of man's origin. Evidence of this interest is to be found in a recent number of the *Outlook* (June 23rd), where Mr. JAMES STANLEY LITTLE discusses the problem of human origin under the title of "concurrent evolution." Mr. STANLEY LITTLE is an evolutionist, but is of opinion that the theory now accepted by the majority of anthropologists —namely, that all existing races of mankind, white, yellow, and black, are the descendants of a common "Adam," or ancestor, is "false and unscientific." He believes that just as two men may discover the same idea or make the same invention independently, so two new and very similar species or breeds of animals may come into existence separately in the wide womb of nature. The underlying idea, that of parallel evolution or orthogenesis, is one which has been, and is being, much debated by professional students. The late Prof. KLAATSCH put forward the idea, which had been tentatively held by some of the older anthropologists, that peoples of the Mongolian type came of an orang ancestry, while the peoples of Africa came of another anthropoid lineage. Some 16 years ago Prof. WOOD JONES startled his fellow anatomists by putting forward the theory that man and the anthropoid apes had arisen and evolved independently from a basal primate stock, acquiring their many points of structural resemblances in the course of their separate evolution. Quite recently Dr. H. FAIRFIELD OSBORN, who has made a special study of the evolution of horses and elephants, and proved amongst them instances of parallel or "convergent" evolution, has separated man's lineage from that of anthropoid apes and carried both as independent lines into a distant geological past, thereby exciting much current comment throughout the American continent. Even Huxley wrote in a letter to Romanes (1888) that "it is quite conceivable that every species tends to produce varieties of a limited number and kind, and that the effect of Natural Selection is to favour the development of some of these while it opposes the development of others along their *predetermined* line of modification." Thus in postulating an independent origin and an almost predestined evolution for the diverse races of modern humanity Mr. Stanley Little can claim a considerable amount of professional justification. The point at issue is not the truth of evolution; that theory is accepted by all intelligent critics; what has yet to be finally determined is the mode by which new breeds or species are produced in a state of nature. The laws of heredity are not in doubt, but their degrees of plasticity have still to be probed.

Mr. Stanley Little carries his inquiries into the realm of culture and is a candid critic of those who hold that high civilisations of a similar kind must stand to each other as daughter to mother. For example, he is severe on those who seek to trace the old civilisations of Central America to an Asiatic of Egyptian original. Here again Mr. Stanley Little has stepped unwittingly into another arena of hot professional debate. It was a youthful visit to Mexico that convinced the late Sir Edward B. Tylor that the ancient civilisation of that land must be sought for in the Old World, but as he went on he found so many points which were difficult of reconciliation that he relapsed to the older explanation which postulated that human mentality was the same all the world over and therefore solved the problems of a budding civilisation by adopting corresponding measures. In recent years Prof. Elliot Smith has brought forward much cogent evidence to demonstrate that Tylor's original idea was right—that there had been a cultural drift across the Pacific from Asia to America many centuries before the time of Columbus. At the present time the "diffusionist" theory—that a forward swing of the pendulum of evolution, whether in ideas, arts, or in biology, is single-centred—is in the ascendant; from a cradle of inception ideas and invention spread from land to land. A concrete instance may serve to illustrate the nature of this problem. So many are the points of difference—as well as of resemblance—between the railroad services of America and of England that did we not know as a historical fact that one was derived from the other we might be inclined to cite them as cases of independent or parallel evolution.

Mr. Stanley Little cites the development of languages in support of his contention that evolution works in a "concurrent" way. "All languages were," he asserts, "evolved innocent of literary form, yet they all, or nearly all, generated, so to speak, grammars of sorts, roughly considered, having affinities in their major aspects, however different in their minor details." Certainly it is true that no living thing—and language and art are just as alive as any form of protoplasm—can continue without change, slow as that change may be. Already we see that the English tongue of Britain and that of the United States do tend to move apart, whatever may be the nature of the driving force involved. But when we find languages such as Italian, Spanish, and French, with so many close resemblances, we should explain those resemblances by postulating a common ancestry—even if we knew nothing of Latin. We should never dream of ascribing them to independent or parallel origins. In like manner we are justified in ascribing all Aryan forms of speech to a mother tongue. The biologist in explaining the close resemblances between all living races of mankind proceeds in exactly the same manner. Why should he postulate several sources when one is sufficient? The student of human evolution brigades man and anthropoid apes together because they are so alike in the fundamentals of their structure. He does not postulate separate origins for them, because if evolution is true it is much easier to derive man's structure from that of a primitive anthropoid than from a very lowly ape-like tarsioid.

Annotations.

"Ne quid nimis."

TESTAMENTARY CAPACITY.

The plain man might think that, if a person be certified as insane, he is ipso facto incapable of formulating a sane will. This was the opinion of Lord Brougham, who held that the mind acts as a whole, and if there be insanity in any one part, then the whole is invalid. With the advance of psychiatry, the issue has been narrowed down to the question—"Was this man capable of making this particular will at the time of its execution?" In Banks *v.* Goodfellow, Lord Chief Justice Cockburn put the pertinent question, "But what if the mind, though possessing sufficient power, undisturbed by frenzy or delusion, to take into account all the considerations necessary to the proper making of a will, should be subject to some delusion, but such delusion neither exercise, nor be calculated to exercise, any influence on this particular disposition, and a rational and proper will is the result; ought we, in such a case, to deny to the testator the capacity of disposing of his property by will?" Thus the whole problem was once more thrown open, and solicitor and medical man must combine to determine whether the testator's mental condition is or is not such as should invalidate his will.

Mr. Noel Middleton has reviewed this position in a paper read before the Medico-Legal Society on June 28th. He reminded his audience that, to have testamentary capacity, a man must possess an understanding of the nature of the business on which he is engaged, a memory of the property of which he has to dispose, and of the persons who have a claim upon him, and must appreciate the manner in which he desires his property to devolve. Soundness of mind is not definable, and the law—fortunately for all of us—does not require a perfectly balanced mind, but lays stress upon the functions of memory and understanding. The disposing mind must have natural capacity not unduly impaired by age, enfeebled by illness, or tainted by any morbid influence. It is essential that no disorder of the mind shall poison the testator's natural affections, but it is immaterial if his judgment be perverted by spite, caprice, or frivolity. Where these affections pass into insanity is as difficult to determine, said Mr. Middleton, as the point at which twilight becomes darkness. The extremes, however, are easily recognisable. From the medical man the court wants to know if he has observed in the patient signs of disease of the brain from any cause, and, if so, whether that disease had any direct bearing on the terms of the contested will. Mr. Middleton classified insanity under four heads, which served his purpose, though they would not appeal to the modern psychiatrist: mania, melancholia, monomania, and dementia. Wills made in the "lucid interval" of mania have often been upheld, but no solicitor should draw up a will under such circumstances without medical advice, and proof would be required that power of rational thought had been restored. A diseased state of mind once having been established is presumed to continue. In Cartwright *v.* Cartwright it appeared that the strongest proof of the existence of a lucid interval arises from the act performed during the alleged interval. If that act were a rational act rationally performed without assistance, a lucid interval might be presumed. The principal danger with the melancholic patient is that, through sheer lack of interest in the world about him, he may consent to sign any document placed before him. Under the head "monomania" Mr. Middleton discussed the vexed question of eccentricity and delusions. Psychiatrists know well the amazing power some paranoid patients have of concealing their delusion when it is to their advantage to do so, and they have more than once defeated skilled cross-examination. Among the "dementias" come the very large and important senile group, and that most difficult of all patients from the testamentary point of view, the general paralytic. Again, as Sir Robert Armstrong-Jones pointed out in the discussion, there is epilepsy, "one of those dominating tyrannical conditions that affects the emotions perhaps more than any other disease."

The jury is faced with the problem of deciding whether or not the deceased was possessed of testamentary capacity. They look to the medical man for a clear and simple account of what he saw and heard when he interviewed the testator. They are happy if their medical witness can describe from notes made at the time his patient's bearing towards the relatives, his memory for recent and remote events, the nature of his delusions, his attitude towards previous wills and any changes made in the most recent of them, and his ability to enumerate, within reasonable limits, his possessions and his dependants. The medical man should always interview the patient alone, save for a nurse or colleague, and ought if possible to see the patient more than once, taking full notes of each interview. The more facts he can lay before the jury, the more likely are they to be able to come to a just decision.

BERI-BERI ON DIFFERENT DIETS.

IN the old conceptions of the ætiology of beri-beri, rice—and often spoiled rice—played the chief part. We know now that rice is not an indispensable factor, though it is a very frequent one. In No. 8 of the Indian Medical Research Memoirs, J. Taylor, C. de C. Martin, and U. Thant describe an interesting study of beri-beri among rice-eaters in Burma; while at a meeting of the Royal Society of Tropical Medicine and Hygiene, on May 17th last, Dr. G. W. Bray gave an account of infantile beri-beri on the Pacific island of Nauru, where the native population never touches rice, but subsists largely on coco-nut products.

Taylor and his co-workers examined the dietaries of a number of the different racial constituents of the population, and concluded that beri-beri is not an important disease among the native Burmese, but is almost confined to the large coastal towns, where it affects imported Indian coolies, not Mohammedans nor vegetarian Hindus to any extent, but chiefly the so-called meat-eating Hindus. It also occurs among Burmans in isolated forest camps, where conditions cause the food-supply to be severely restricted. The disease is shown to have a seasonal incidence, being most prevalent from August to February; it thus occurs chiefly in the wet period, setting in a couple of months after the onset of the monsoon. This greater prevalence in the wet season is tentatively correlated with the greater deterioration, at that time, of stored rice from damp and moulds. Where rice was used which was freshly pounded at frequent intervals, beri-beri did not occur, whereas in exactly corresponding communities, where long-stored rice was used, beri-beri broke out. It is not known whether the moulds introduce a toxic factor, or, as seems more likely, simply make such pericarp as remains on the rice more friable, so that it easily crumbles off and is lost, and with it the vitamin which it contains. It is interesting to see the factor of deterioration restored to its old important place in the ætiology.

The conditions in which beri-beri develops on the island of Nauru show contrasts with those prevailing in Burma. The disease occurs among a population which never touches rice: it affects only breast-fed infants, and its incidence is heaviest in the dry season. Its appearance in the island is only recent and is connected in an interesting way with the political history of the place. The island of Nauru is held by Australia, under mandate from the League of Nations. Supply of alcohol to native peoples in mandated territory is not allowed. In Nauru the intoxicating drink which the natives have used is made from the toddy palm, but now they are no longer supposed to make it. The toddy contains much yeast, and concentrated toddy yeast was found to cure the infants suffering from beri-beri. When a dietary is very limited, interference even with the source of alcohol may cause disaster. A similar instance occurred in the war, when a South African native labour battalion was brought to France; an alteration was made in the preparation of their fermented drink,, scurvy developed, and one of the recommendations made to combat it was the return to the usual native method of preparation.[1] The more frequent incidence of beri-beri in Nauru in the dry season is found to be correlated with a special factor, just as the correspondence of the disease with the wet season in Burma was found to be. In wet weather in Nauru the toddy palm yields much more of the fermentable sap from its inflorescence than it does in dry, and although the consumption of toddy by the natives has been much reduced under the mandate, it is not to be supposed that it would ever completely stop. Thus any factor tending to lower the production of this anti-beri-beri agent would operate to increase the number of cases. Among the interesting contributions to the discussion that followed Dr. Bray's communication was one by Dr. W. H. Aykroyd, who described beri-beri in Newfoundland, where the dietary consists chiefly of white bread and salt meat. He had noticed there that the majority of the cases, 80 per cent. of the whole, were males, and he believed that some social factor must operate to produce this result, but he did not yet know what it was.

SYPHILIS REFRACTORY TO TREATMENT.

THE term "malignant syphilis" is applied somewhat loosely to two distinct groups of cases—namely, those in which the eruption is severe and profuse, with or without profound constitutional symptoms, and those in which the manifestations are refractory to treatment, or recur during the actual administration of modern remedies. A case from the latter group, examples of which occur from time to time in every venereal clinic, is reported in the *Dermatologische Wochenscrift*, June 2nd, p. 727. A man, aged 42, received the usual arsenical and bismuth course for a profuse secondary eruption. Fourteen days later condylomatous lesions recurred on the tongue and round the anus, although the Wassermann reaction was negative. Renewed antiluetic treatment brought about the disappearance of the lesions and a positive W.R. The first mercurial injection of the third course was followed by an urticarial syphilitic eruption, and the W.R. became negative again. This eruption was uninfluenced by intensive treatment with neosalvarsan, bismuth, and iodides, but the W.R. remained negative. An intracutaneous injection was given of syphilitic vaccine from rabbit chancres ("luotestin," 0·2 c.cm.): pronounced local and focal reaction in the lesions followed the first injection, and after the second the W.R. became positive. The third injection resulted in the involution of the eruption. Four more doses of luotestin were given, and the treatment was then purposely stopped. Ten days later there was a gyrate macular rash on the trunk and syphilitic papules on the right tonsil, and now the W.R. was, as it should be, positive. Another injection of luotestin and a small dose (0·15 g.) of neosalvarsan promptly cleared up both these manifestations, which had not recurred at the time of reporting the case. It will be noted that an abnormally reacting organism, indicated by the urticarial eruption, negative W.R., and refractiveness to salvarsan, was converted into a normally reacting mechanism, as evidenced by the macular eruption, positive W.R., and receptivity to salvarsan. Rosner's view that the negative W.R. during the eruptive stage is a sign of defective natural protection is one which will be shared by most authorities, and it seems probable that the injections of luotestin to some extent stimulated production of antibodies. This would explain the appearance of local and focal reaction in the rash itself, but does not altogether account for the paradoxical gyrate eruption with tonsillar lesions that followed ten days after the seventh injection of luotestin. Rosner suggests the word "contra-reaction," and raises the question of an altered response of the blood-vessels in the lesions, leading to their paradoxical contraction, with dilatation of vessels in the vicinity. The theory is too conjectural for further consideration at present, but there is no doubt that administration of luotestin and similar protein bodies, which may or may not be specific, have a practical bearing on the treatment of salvarsan-refractory types.

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[1] H. W. Dyke: THE LANCET, 1918, ii., 513.

THE CAUSE OF SUDDEN DEATH IN CRIMINAL ABORTION.

AN adequate explanation of sudden death during criminal attempts to procure abortion is still to seek: in medico-legal cases the cause has often been ascribed to shock, but this view has not met with general acceptance. Sudden fatalities are so rare in legitimate operations that they have never become associated in the minds of obstetricians with the therapeutic induction of abortion, the evacuation of an incomplete abortion, or the closely allied procedures of dilatation, exploration, and curetting of the uterus. Few even of those with a long and varied experience of hospital and special practice have met with a single case. To explain this apparent anomaly factors peculiar to the special circumstances in which criminal abortion is attempted have been invoked, such as mental distress, fear, and other emotional states in the patient, or haste, lack of skill, or faulty methods in carrying out the manipulation. The economic stress of the war and post-war years in Central Europe has greatly increased attempts to procure abortion, and the mortality accompanying it has drawn attention to the causes of death or of serious complications. In Germany the method commonly adopted is the injection under pressure of fluids, usually soapy water, into the uterus. According to H. von Hoesslin[1] this manipulation is not infrequently followed by sudden and dangerous symptoms, either cardiovascular or cerebral in origin, and a non-fatal case of the latter type is recorded and discussed in the light of others collected from German literature. As it is almost impossible to avoid the injection of air with the fluid, death is frequently ascribed to air embolism, and von Hoesslin's interpretation of his case in the absence of post-mortem investigation is that the quantity of air in the cerebral arteries was too small to cause serious circulatory disorder but was sufficient to interrupt temporarily the nutrition of the delicate cortex. The case he recorded was that of a woman of 26, who collapsed and later became unconscious after the injection into the uterus, at high pressure, of a soap solution. The patient was soon after admitted to the Hamburg-Eppendorf Hospital where she had several left-sided epileptiform convulsions, and on the day after admission expelled a dead fœtus. The urine was free from albumin and sugar, the Wassermann reaction was negative, and lumbar puncture gave no evidence of raised pressure. There were no further fits and consciousness began to return after the fourth day, though the patient had a right-sided paresis, remained drowsy, and complained of severe headache for some time longer. All symptoms gradually cleared up and she was discharged well in four weeks. The passage of blood containing air-bubbles through the pulmonary capillaries is shown to be possible by experimental work on animals. It has been stated, also, that in 30 per cent. of mankind the closure of the foramen ovale is imperfect to a degree sufficient to permit frothy blood to escape from the right to the left side of the heart. When death results from circulatory disturbance following the introduction of air into the vessels the cause would appear to be frothing of the blood on the right side of the heart; in less acute cases there may have been penetration into the coronary veins of chains of bubbles working against the current and the consequent production of cardiac failure. This sequence of events has been produced experimentally in animals by L. Jung and L. Auger.[2] The great importance of learning the real explanation of sudden death in criminal abortion makes it essential that every case of the kind should be carefully investigated, and the possibility of air-entry into the circulation is one that should be fully explored.

FRACTURES SET BY MACHINERY.

Dr. John J. Moorhead, of New York, describes[3] a method of reducing displacement in fractures of the long bones, which he considers superior to those now in use. Plaster-of-Paris cases are applied above and below the seat of fracture and traction and counter-traction are applied through them. The distal portion of plaster is connected with an electromotor which can be regulated so as to exert any amount of undulating force likely to be desirable. When the surgeon is satisfied that correction has been attained, the motor is stopped in the position of maximum pull and the gap between the plasters is filled in with more plaster-of-Paris. The apparatus is not fully described in the paper, nor are the illustrations of much help in elucidating the details of the mechanism, but we gather that the minimum desired degree of tension is produced by a hand screw, superimposed upon which is the alternating pull of the electromotor. The alternate pull and relaxation is produced by an eccentric. The apparatus is obviously not one for every practitioner to keep in his surgery, and is only likely to be used in casualty departments of hospitals which deal with a large number of fractures. Radiograms are reproduced from a case of compound fracture of both leg bones, treated by this method, but judging, as we must, by this one case, we feel no certainty that its results will be any better than those obtainable by less elaborate methods. It seems probable that traction will have to be maintained at its maximum for a good many hours while the fresh plaster is setting to a sufficient degree to resist compression, and that trouble is likely to arise from this pressure. The final radiogram does not show a perfect anatomical result, although functionally it may be perfect. A costly and elaborate apparatus such as this must justify its introduction by improved results after repeated tests if it is to gain a permanent place in the surgical armamentarium.

PERMANENT ENLARGEMENT OF A CONTRACTED PELVIS.

THE permanent enlargement of a contracted pelvis by means of bone-grafts has been effected in two cases by Dr. F. H. Albee.[4] The technique involves a horizontal incision of the symphysis pubis, section of the pubic ligaments, and separation of the innominate bones at the symphysis. A graft taken from the tibia is then inserted in the hiatus between the innominate bones, and is sutured in place with kangaroo tendons. The author explains that the graft method has the advantage over symphysiotomy and pubiotomy that these may have to be repeated at each pregnancy, while the enlargement of the pelvic ring by bone-graft is permanent. Another reason given by Dr. Albee for his preference is that, in his experience, the force required to separate the bones is very great, and he considers it undesirable that this force should be exerted wholly through the presenting part of the child as it must be after symphysiotomy. Presumably he is here considering the child, for it seems doubtful whether for the mother a sudden severe wrench would be any more desirable. Many surgeons, especially in America, believe that the sacro-iliac joints are liable to give rise to painful symptoms, even when so far as can be ascertained they have not been subjected to undue strain. A permanent wedge, for the insertion of which the bones have had to be separated 1½ inches, must surely cause tension of ligaments, if not some degree of displacement of these joints. It is recorded that both patients operated on were delivered of normal children after operation; one of them has since had three normal labours. We are not told, however, whether they are free from backache or other symptoms which might be expected to follow such a gross insult to the skeletal frame. Indeed, the case reports which form part of Dr. Albee's article are somewhat meagre, and though there was doubtless justification for drastic action, little evidence is submitted on this point. In one of the patients no trial labour seems to have been allowed, and the report of the obstetric history of the other, who had had a craniotomy, gives no details of the events leading up to a catastrophe which might have been due to causes other than a contracted pelvis. Obstetricians are constantly being asked to perform Cæsarean sections on patients who subsequently deliver themselves without interference, and it must be emphasised once again that convincing proof of the impossibility of normal delivery should be forthcoming before any operative procedures are contemplated.

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[1] Münch. Med. Wochenschr., 1928, lxxv., 764.

[2] Compt. rend. de la Soc. de Biol., 1928, xcviii., 702.

[3] Amer. Jour. Surg., May, 1928, p. 525.

[4] Surgery, Gynecology, and Obstetrics, 1928, xlvi., 845.

CARDIAC PAIN IN RHEUMATIC FEVER.

It may be assumed that in acute rheumatic fever præcordial pain with hyperalgesia generally means involvement of the heart. The subject has now been studied statistically by Dr. H. F. Swift and Dr. C. F. Hitchcock,[1] who have investigated 154 cases of acute rheumatic fever over a period of more than seven years. They show that the frequency with which præcordial pain and hyperalgesia is encountered is roughly proportional to the intensity of the rheumatic infection, and hence to the frequency of cardiac involvement. While the absence of cardiac pain during the acute attack does not necessarily show that the heart has escaped injury, its presence is strong evidence of damage to the valves. Præcordial pain with hyperalgesia is observed more often during recurrent rheumatic fever than during the first attack. In the first attack of fever two-thirds of the patients with præcordial pain showed other evidence of cardiac involvement, and almost all the remainder developed cardiac lesions later, or during subsequent attacks. Incidentally, Swift and Hitchcock confirm the well-known observation that patients with subcutaneous rheumatic nodules almost always have concomitant signs of cardiac involvement. They point out that as our knowledge of the nerve-supply of the heart is still incomplete, any conclusions about the mechanism by which the pain arises must be mainly tentative. It may be noted, however, that the cardiac lesions of rheumatism are in the perivascular and adventitial tissues, and that the evidence goes to show that the cardiac tissues capable of giving rise to painful sensations are mainly situated in the epicardium, pericardium, and the adventitial coats of the aorta and coronary arteries, the endocardium and myocardium being probably insensitive. They think that the pain associated with pericarditis is not due to mechanical irritation by rubbing, but rather to the intensity and nature of the underlying inflammatory process. A pericardial rub may often be heard in patients who have no pain, and an extensive pericarditis may be discovered at the autopsy of a patient who has never had præcordial pain. On the other hand, severe pain may be felt before clinical evidence of pericarditis is manifest. Signs of rheumatic pericarditis are almost always accompanied by evidence of valvular and myocardial involvement, but valvulitis and myocarditis of equal severity may occur without pericarditis, and in these cases similar præcordial pain is often present. "It seems, therefore," they say, "that the præcordial symptoms which have been described and attributed to pericarditis by many observers are merely indicative of the severity of the pancarditis."

THE PROVISION OF GLASSES FOR VERY FINE WORK.

Eyestrain among persons performing very fine work is presumably due partly to excess of accommodation required, partly to excess of convergence. An investigation just carried out by the Industrial Fatigue Research Board[1] concerns two sets of workers, the one engaged in the mounting of lamp filaments, the other in a process of threading for the loom in which a thread has to be drawn through as many as 123 eyes per inch. The mounting of lamp filaments was the finer work and for this purpose glasses were provided which added 4 dioptres of accommodation for each eye and 6 degrees converging prisms for work at about 6 inches. At the same time any error of refraction was corrected. The result was an increase of output, though this was slight among those who were previously the best workers. To loom workers the relief given was 2 dioptres of accommodation and 4 degrees converging prisms in addition to the distance correction. Here also the result was favourable, and Mr. T. G. Clegg, who prescribed the glasses, attributes the improvement chiefly to the relief afforded by the convex prisms. The objection is obvious that this wholesale treatment does not sufficiently take into account individual requirements. The need for relief might well be present at the age of 30 when the average accommodation is about 8 dioptres and absent at the age of 20 when it is about 11 dioptres. The power of convergence again is one that varies greatly in different individuals not only with age but with general health and, of course, with muscle balance. Fatigue is liable to ensue, according to Landolt, if more than one-third of the converging power (reckoned in metre-angles) is continuously called upon. Among those workers whose refraction is not normal the wearing of glasses with distance correction would by itself do much to diminish fatigue. But psychological factors, especially the influence of suggestion, cannot be ignored when the results are being assessed, while the incidence of physical fatigue from causes not primarily connected with the eyes has also to be considered. The outcome of this study is that the provision of glasses relieving both accommodation and convergence for very close work has, on the average, a beneficial effect, but to what extent the efficiency of any particular worker may be enhanced by their use cannot be judged without detailed investigation.

THE SHEFFIELD MEDICAL SCHOOL.

The celebrations to be held next week at Sheffield in connexion with the centenary of the medical school, now the medical faculty of the University of Sheffield, recall to all who would learn of the development of medicine in this country a very interesting page in history. The story has been well told by the late William Smith Porter, senior physician to the Sheffield Royal Infirmary, whose delightful essay on the subject has just been published, and deserves to be widely read. This story commences in July, 1828, but previous to this date a Sheffield surgeon, Mr. Hall Overend, had begun to make collections for a museum of anatomy, human and comparative, the use of which by his apprentices and those of his neighbours was providing a quite unusually good scientific training to Sheffield students. The museum was the private property of Hall Overend and his son, Wilson Overend, but when, in 1828, a movement was promoted by a Sheffield physician, Sir Arnold Knight, and others for the establishment of a medical school in the city, it was proposed to utilise the Overend Museum. This was sheltered in a wing of the Overends' house, and when this building was contemplated as the nucleus of the new school the troubles that arose from the proposal to employ private property for public purposes were inevitable. For one group of medical men, out of a recognition, no doubt, of the Overends' pioneer labours, desired to maintain the Overend Museum as a permanent centre of the new school, while another group, foreseeing the complications that might ensue, wished to make a new start, taking the form of a Medical Institution. The term "school" was not employed in connexion with this later movement, which was directed rather to the formation of what would now be considered a learned society, and this perhaps accounts for the fact that in the first instance the Overends, father and son, appear to have been quite friendly to the scheme. But the new Medical Institution soon became the centre of medical education in Sheffield, in accordance with the prevailing views for the training of students, and thus for a short time Sheffield possessed two rival schools, with the disagreeable division of opinion thus implied. But the dissension came to an end dramatically by the disappearance of the Overend Museum. The Museum itself had been removed from the back of the Overends' house, owing to the feeling that pathological specimens were inconvenient property to have on domestic premises at a time when the public feeling against body-snatching was so high. And the action was certainly prudent, for in 1835 the Museum was sacked and destroyed by a mob, inflamed by the accounts of the Burke and Hare atrocities. But although the Sheffield School of Medicine did not have its material start in the Overends' Museum, Dr. Porter says, and all will agree with him, that Hall Overend was the true founder of the Sheffield medical school. The rise of an entirely independent institution was the only sound method to ensure permanency for the ideals of the Sheffield citizen, but the ideals themselves were implanted by Hall Overend.

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[1] Jour. Amer. Med. Assoc., March 3rd, p. 678.

[1] On the Relief of Eyestrain among Persons performing Very Fine Work. By H. C. Weston, M.J.Inst.E., and S. Adams, M.Sc. Industrial Fatigue Research Board Report No. 49. H.M. Stationery Office. 1928. 1s. 3d.

While the beginnings of the Sheffield School of Medicine are quite clearly chronicled, the next stage appears to have escaped public notice generally, for even the Sheffield Local Registers are silent as regards the school between the years 1835 and 1850. Evidently the school showed no promise of great developments before the year 1883. But in that year the association with the Firth College wrought a magical difference in outlook and performance, and four years later the foundation-stone of the new school in Leopold-street was laid, after which the record of success becomes progressive. Of the growth from a university college to a faculty of medicine in a university nothing need be said, as such recent medical history must be familiar to all our readers. We follow Dr. Porter in quoting the concluding words of the inaugural address at the foundation of the Sheffield School of Medicine in 1828. "If it be competent," said Sir Arnold Knight, "to supply that knowledge which the increasing wants of an improving profession so urgently require—if it be calculated to advance the interests of the general practitioner—if by increasing the intelligence it add to the dignity of the profession and render its honours still more an object of ambition among the truly great—if by promoting professional skill it tend to alleviate the sufferings of mankind . . . then will the Sheffield Medical Institution succeed: and it will succeed—because it will deserve success." No doubt these words were greeted one hundred years ago with an approval that their powers of prophecy deserved.

A DINNER TO SIR ROBERT JONES.

ON Thursday, June 28th, a group of surgeons—friends, colleagues, and pupils—entertained Sir Robert Jones to dinner at the Café Royal, London. A book, specially written for the occasion and entitled The Robert Jones Birthday Volume, was presented to him, comprising a collection of surgical essays written by experts in his own subject with full knowledge of the position occupied by Robert Jones. This feeling was admirably set out by Sir Berkeley Moynihan, who was in the chair, in a speech distinguished alike by its brilliance and its affectionate intimacy. As an indication of the feelings which prompted the tribute, a few of Sir Berkeley's actual words may be quoted:—

> "This volume, written by a band of brothers, is dedicated with greatest respect and with warmest affection to Sir Robert Jones on the occasion of the seventieth anniversary of his birth. The opportunity to pay tribute to our friend, in whom we recognise one of the masters of surgery, was most eagerly welcomed. We felt that it gave us the chance to say openly what has long been in our hearts, in regard to his work for our profession, and in acknowledgment of the inspiration, encouragement, and example he has given to all who have had the high privilege of association with him. All those who contribute to this volume are proud to think that the influence of Robert Jones, of his methods, and of his teaching has inspired them, has found a place in their work to be transmitted by them in due time to their successors. Spirit alone is immortal. In the practice of orthopædic surgery the spirit of Robert Jones will live for ever. To Robert Jones, great surgeon, inspiring teacher, loyal colleague, and good friend, we affectionately inscribe this volume."

In addition to Sir Robert's daughter and son-in-law, Mr. and Mrs. Frederick Watson, and his son and daughter-in-law, Mr. and Mrs. Arthur Probyn Jones, the following were present: Sir Berkeley Moynihan, Sir Harold Stiles, Sir John Lynn-Thomas, Mr. E. Muirhead Little, Prof. Murk Jansen, Mr. A. B. Mitchell, Dr. Thurstan Holland, Sir William de Courcy Wheeler, Mr. E. Laming Evans, Mr. H. A. T. Fairbank, Prof. E. W. Hey Groves, Mr. R. C. Elmslie, Mr. A. S. Blundell Bankart, Mr. W. Rowley Bristow, Mr. Naughton Dunn, Mr. G. R. Girdlestone, Mr. Harry Platt, Mr. D. McCrae Aitken, Mr. W. H. Trethowan, and Mr. T. P. McMurray.

INTERNATIONAL STANDARDISATION OF DIGITALIS AND ERGOT.

THE first insight obtained by any student into the principle of international units of measurement dates from his school days. When he opened his first text-book on physics he learned with surprise that the metre, which was the familiar basis of many of his sums, could be defined with accuracy only as the distance, at the temperature of melting ice, between two marks cut in a bar of durable metal preserved in Paris. It would be absurd to pretend that such precise standards will ever be available in the sphere of pharmacology or therapeutics, but their development on scientific lines must depend largely on the extent to which it is possible to set up units of measurement common to all countries. The practitioner has hitherto not been very exacting in his demands for standardised drugs, or, indeed, very receptive to suggestions from pharmacologists that a popular mixture is not necessarily a potent one. He has been content to assume that the preparations of such drugs as digitalis, squill, and ergot in common use are of uniform strength without inquiring closely into the grounds for this assumption. Recent research has shown that his confidence is misplaced, and that the great variations in clinical response which he has doubtless attributed to the idiosyncrasies of the patients are at least as likely to be due to the differences in the activity of the drug exhibited. The Health Organisation of the League of Nations is thus doing most valuable work by collecting together experts from all countries with the idea of devising tests for the potency of those therapeutic substances which cannot be standardised by purely chemical means. The permanent Commission appointed by the League to consider the standardisation of sera, serological reactions, and biological products have already dealt with salvarsan, insulin, and pituitary extract on these lines, and the report[1] of their last session, held at Frankfort in April last, shows that they have made considerable progress towards the establishment of a uniform international unit for preparations of digitalis

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[1] Publications of the League of Nations: Health, 1928, iii., 6.

The late Prof. Rudolf Magnus of Utrecht was asked in 1925 to make a dried powdered *preparation* of the leaves of *digitalis purpurea* of a certain strength. He was instructed to use for this purpose a mixture of 10 different powders, made from leaves properly dried at 55–60° C., to adjust its activity by biological assay on cats, and to distribute the *preparation* for international use. The activity of the standard *product was to* be controlled by annual tests, and if it should deteriorate, or the supply become exhausted, a new preparation of equal activity was to be made. This *work* was duly carried out, and favourable reports on the standard product have been received from various countries. The Commission of the League of Nations have therefore decided definitely to adopt the preparation for international use. *Arrangements* for renewal of the standard have had to be reconsidered owing to the death of Prof. Magnus, and Dr. Bijlsma, of Utrecht, has been entrusted with the task. Only when the new standard has been proved by various biological tests—such as intravenous infusion in mammals or the lethal dose method in frogs—to be identical in activity with the existing one, will it be forwarded to the National Institute for Medical Research for distribution on behalf of the League of Nations. In future, when the dosage of digitalis or its preparations is expressed in units of activity, the unit employed will be the specific activity contained in 0·1 g. of the international standard powder. As to ergot, in view of the results of recent clinical work,[2] showing that the essential factor in the activity of ergot on the uterus is the action of the specific alkaloids, the Commission have decided to proceed with the standardisation of ergot and its preparations by a method measuring its content of the specific alkaloid (ergotoxine or ergotamine). For this purpose the method of Broom and Clark, using the isolated uterus of the rabbit, will be adopted. The possibilities of preparing a stable standard for squill are now being explored. When such popular drugs as digitalis, ergot and squill have been added to the list of standardised substances, some important obstacles to the correlation of clinical impressions with experimental observations will have been removed.

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CCLXXXIII.

THE SURGICAL TREATMENT OF CHRONIC INFECTIONS OF THE SEMINAL VESICLES.

CHRONIC infections of the seminal vesicles are responsible for a considerable amount of ill-health, causing as they do persistent urethritis with unfitness for marriage, sterility, crippling arthritis, myositis, relapsing cystitis with rigors, epididymitis, and many other complications of "subinfection" or "intermittent bacteriæmia." Local urethral treatment, diathermy, vesicular massage, intravenous injections of neosalvarsan, or protein shock therapy will often bring about a cure. But many cases remain where cure can be hastened or can only be attained by lavage of one or both seminal vesicles by way of the vas. The operation of vasostomy or vasotomy, devised by Belfield,[1] of Chicago, in 1905, since modified by him and others in many important particulars, and performed by him on more than 1100 patients, should be more widely known and practised in this country, since recent improvements in technique have done away with complications which at first proved troublesome and caused the operation to be viewed with disfavour.

The operation has been criticised chiefly on the ground that if it is not properly carried out it may *lead to a stricture of the vas* with consequent sterility. Quite apart from the fact that most of the patients who need the operation are already sterile as the result of the disease of the vesicle, it is now known that stricture of the vas should not follow the operation when performed according *to* the latest *technique*; and, indeed, it is likely to render fertile many persons who without it would be condemned to permanent sterility. It appears, from numerous observations and experiments, that colloid silver, or other chemical, when *injected* into the lumen of the seminal tract does not injure in any way the epithelial lining of that tract. On the other hand, if colloid silver or other chemical be permitted to leak into the interstitial tissues around the vas, funiculitis may be produced, *and in some cases* lead to a stricture of the vas at the site of the incision. Such a condition can be remedied by the perfected operation of vasectomy with end-to-end suture. But with the new technique of vasotomy this necessity is not likely to arise. For instance, Dr. Clinton Smith, of Kansas City, reported 100 consecutive cases in which he was able to test the sperm at long intervals *after* the operation. In 98 of the cases living sperm was found. The chances, then, of sterility seem remote.

All who have had extensive experience of this operation are now pretty well agreed that attempts to leave a *cannula* in the vas *for* repeated washings should be given up. It was these attempts that led to reflux of the chemical injected and to subsequent stricture formation. It was found that stricture might result whatever chemical antiseptic was used for the injection. It was *not* the nature of the antiseptic, but it was the reflux of the antiseptic into the interstitial tissues that caused *the stricture*. Since colloid silver is found in practice to be the most efficient antiseptic, it should be used in preference to *any other* so far suggested, such as acriflavine.

The operation should not be carried out in the out-patient department. Patients should be confined to bed for two or three days at least, preferably four to five days.

Technique of Vasotomy.

The operation can be carried out under local or general anæsthesia. If *a local* anæsthetic is preferred, it is administered as follows. Pick up the cord at the top of the scrotum and inject into its substance 5 c.cm. of 1 per cent. novocaine adrenalin solution. Choose the site of the skin incision near the top of the scrotum and inject along this with a fine needle some 10 c.cm. of ½ per cent. novocaine adrenalin solution.

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The vas should be isolated beneath the scrotal skin with the gloved fingers or a special clamp and a small incision be made directly down until the coverings of the vas are exposed. The vas is caught by a pair of sharp-toothed Volkman's forceps and held up in the left hand. With a few touches with a sharp knife the outer coatings of the vas are cleared until the flat handle of a scapel can be gently insinuated between the vas and the other structures of the cord. This is thrust through so as to keep the vas well out of the wound, after which any bleeding points that need attention should be securely ligatured. The vas must be well cleared of the surrounding tissue sheaths, an important point. With a fine-pointed tenotone a tiny opening is now made in a longitudinal direction through the wall of the vas so as to expose the lumen. This can soon be learnt by practice and is the most delicate part of the operation. A fine stiff length of silkworm-gut is now threaded into the vas and will usually pass easily for some 10 in. towards the vesicle. In some cases inflammatory strictures of the vas or inspissated pus will prevent the passage of this gut, in which case it may be thought advisable to desist from injecting the vas. If the lumen is patent a thin sling of gauze is inserted under the handle of the scapel to steady it and catch any drops of escaping fluid. A blunted needle (gauge 20) attached to a well-fitting syringe filled with 10 c.cm. of 5 per cent. colloid silver is insinuated into the lumen of the vas, great care being taken not to rub up the mucous membrane with the point of the syringe. Those who have had little practice are advised to inject sterile water to see if the passage is clear before resorting to the main injection. Five c.cm. of 5 per cent. colloid silver are then slowly injected and should flow easily away to fill the vesicle and ampulla. If 5 c.cm. flow in quite easily, a further 5 c.cm. may be injected. After a pause the syringe is removed and the opening in the vas most carefully closed with one or two 00 catgut sutures. These sutures should only take up the outer coat of the vas and should effectually prevent all reflux of the chemical injected. The vas is then dropped back into place and the skin united with a catgut stitch.

The patient should be confined to bed for at least three or four days to prevent complications, as a little fever is not unusual. The colloid silver may not appear in the urine for many days after the injection. In such cases the effect is always curative. Cures of the infected vesicle will be obtained in the majority of the cases by one injection. If a cure is not attained, then the vas can be exposed a second time a week or ten days later, and the injection repeated at a site a little higher up. In this way risk of stricture and sterility is avoided and the desired result is obtained.

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The diagnosis is established especially by careful rectal palpation of the vesicles with the trained and expert finger, the presence of necrospermia and pus in a condom specimen of the sperm, persistent relapsing swellings of the epididymis, and bacteriological investigations of the spermatic fluid. Experience can alone decide as to whether the operation must be carried out on one or both sides in any particular case. It is not always necessary to operate on both sides.

Vasotomy in Gonorrhœa.

Recently vasotomy has been advocated for all cases of acute gonorrhœa. I have been so impressed by the immediate and rapid cure of cases of chronic vesiculitis where no other treatment has been employed, except a single lavage of one or both vesicles, that I am quite prepared to believe that lavage of the vesicles on one or two occasions might rapidly cure recent acute gonorrhœa. Kenneth Walker's experiments on animals and certain clinical features of urethritis are suggestive in this connexion. The results of experience can alone decide such a question. The operation of vasotomy has come to stay. It must remain an operation to be practised only by those who are willing to give up some time to learning accurately the technique, and should not be condemned by those who have had no experience of it or who refuse to follow the minute steps necessary for success. I have had many striking results with it in a series of extremely difficult cases.[2] I cannot too strongly call for its consideration by those who are in charge of venereal disease clinics and military and naval hospitals.

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WITH 4700 members and a progressive Council the Royal Sanitary Institute has established itself as an organisation which has an important place in the community. Every year it arranges some 250 meetings and lectures in various parts of the country; it conducts examinations for health visitors, and organises those which qualify sanitary inspectors; it annually distributes 60,000 copies of a journal reaching a high standard of public interest; it keeps up a valuable museum visited by large numbers of people; and it has rendered excellent service in arousing interest in sanitary science throughout the Empire, branches having been established in most of the Overseas Dominions. While this steady development has been the work of many hands, it is largely due to the assiduous and capable service of the permanent staff, of which Mr. E. White Wallis, O.B.E., the secretary and director, has been the principal member for 48 years. Mr. Wallis has shown himself a skilful organiser, equipped with imagination and foresight. His gifts have been applied unceasingly to the work which he undertook in 1880, and his success as a manager must be evident to all who have attended the congresses of the Institute or studied its history. At the dinner at the Café Royal, given in his honour on June 27th, the Duke of Northumberland, President of the Institute, was unfortunately prevented from taking the chair as he intended, but Prof. Bostock Hill, who took his place, clearly expressed the feeling of the company when he said that Mr. Wallis's services, both in quantity and quality, must be almost unrivalled. After a presentation had been made, Mr. Wallis referred to the widespread activities of the Institute, which had now, he said, attained a standing which would form a foundation for future work and development. In this development we hope that he will continue to take an active share.

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Special Articles.

DEATHS AND DEATH-RATES IN THE MERCHANT MARINE, 1926.

BY FLEET-SURGEON W. E. HOME.

A RETURN[1] published by the Board of Trade summarises the deaths that occurred in 1926 in the mercantile marine. No death-rate for seamen is prepared by the Board of Trade, on the ground that no precise knowledge is available of their number, but only of their deaths. The Board does, however, allow that "the numbers of persons forming the first crews of vessels," stated annually in the above-mentioned return, furnishes "an approximate basis *for estimating* the variations in the extent of the risk from period to period." I have prepared Table I., attempting to use such data as is available from the return and from the Registrar-General's Decennial Supplement on Occupational Mortality (1927, H.M. Stationery Office, 7*s*. 6*d*.), in which (pp. 126–128) is a discussion of the mortality of seamen, 1921–23. This supplement did not appear till 1928.

The total number of deaths of employed or occupied sailors is known, and their causes are nowadays, we are told, being more correctly stated. It is the average daily number of seamen amongst whom these deaths arise of which we are uncertain. Every year the numbers in the "first crews" of ships are published, and every five years a census is taken of all seamen in seagoing vessels, registered in the British Islands, except yachts and fishing boats. This census, taken all over the world on a single day in 1901, 1911, and 1921, showed a number much less than the number given in the return of persons forming "first crews," the proportion being respectively 82 per cent., 81 per cent., and 55 per cent. in the three years. The census in 1921, the latest available, was taken during a coal strike, attended with great unemployment for seamen. What proportion of "first crews" can we then assume to be the number usually employed? I submit that 90 per cent. would in ordinary times be near it, and in 1921 70 per cent., and that these figures may be used, in the words of the Board of Trade, as "an approximate basis for estimating the variations in the extent of the risk." The Board of Trade gives no suggestion of its own idea of these variations, nor until this year has any official figure been put forward; even now no figure is given for occupied seamen, but only fo occupied and retired seamen together.

TABLE I.—*Deaths and Death-rates in the Merchant Marine.*

	1901.		1911–12.		1921.		1926.	
No. of "first crews"	146,860		165,159		173,110		159,950	
Percentage taken	90		90		70		90	
No. of men taken	132,170		148,640		121,177		143,995	
	Deaths—		Deaths—		Deaths—		Deaths—	
	No.	Per 1000.	No.	Per 1000.	No.	Per 1000.	No.	Per 1000
Enteric	35	0·27	58	0·39	27	0·22	28	0·19
Small-pox	17	0·13	8	0·05	4	0·03	7	0·05
Malaria	28	0·22	31	0·21	40	0·33	13	0·09
Tubercle (all) ..	45	0·34	44	0·29	26	0·21	41	0·28
Pneumonia	50	0·38	52	0·35	56	0·46	63	0·44
Diseases of the circulatory system	126	0·96	88	0·59	55	0·45	56	0·39
Suicide..	69	0·52	46	0·30	30	0·25	30	0·21
All diseases	555	4·20	519	3·50	362	2·99	410	2·85
Alcohol	120	0·91	111	0·74	42	0·35	31	0·21
All violence.. ..	978	7·40	1503*	10·11	461	3·80	448	3·11
All causes	1653	12·50	2133	14·35	865	7·14	889	6·17

* 604 (4 per cent.) drowned in *Titanic*.

In Table I., then, is a statement of death-rates in the merchant marine in 1901, 1911, 1921, and 1926, with the numbers of "first crews"; the number of men supposed to have been daily on board ships in each year, and the deaths from certain causes are also given. The greatest decrease in death-rates in the quarter of a century is in those from alcohol, from 120 deaths (death-rate 0·9) in 1901 to 31 (0·2) in 1926; but the rates for enteric, small-pox, diseases of the circulatory system, suicide, and "all diseases" have *satisfactorily* decreased, for tuberculosis (all forms) rather less, while those for pneumonia seem larger. Except as regards alcohol and suicide the decrease is not large enough to dispel anxiety about the health of the merchant marine. Is it *improving* in health as rapidly as is the population ashore?

Table II. sets out the death-rates of the merchant service in 1926, obtained as has been described, against those of the Navy (1925) and the Army (1926), taken direct from their reports published this year. The death-rate of the Air Force (1926) is calculated from the figures of deaths given in that report, which is concerned with a much smaller total of men than are those of the other services. Next come the merchant service figures of 1926, followed by two columns, calculated from figures on p. 128 of the Decennial Supplement about which some remarks must be made.

TABLE II.—*Death-rates in the Services and the Merchant Marine.*

—	Navy. 1925.	Army. 1926.	R.A.F. 1926.	Merchant marine.		
				"Occupied." 1926. Board of Trade.	"Occupied and retired." 1921–23. Registrar-General.	
					Ages 20–45.	Ages 20–65.
No. of men ..	90*	190*	33*	144*	155*	200*
Enteric	0·03	0·06	0·1	0·19	—	—
Tubercle (all) ..	0·40	0·17	0·2	0·28	2·2	2·1
Pneumonia ..	0·15	0·31	0·2	0·14	—	—
Dis. of circulatory system ..	0·15	0·11	0·15	0·39	—	—
Suicide	0·11	0·14	0·2	0·21	—	—
Accidents.. ..	1·32	0·74	3·39	3·11	3·10	3·4
All causes ..	2·82	2·35	4·6	6·17	10·4	13·5

* Thousands.

When that Decennial Supplement was being prepared some doubts were thrown on the statistics of the occupational mortality of seamen presented in the corresponding report for 1901. These doubts were considered by a departmental committee and (p. 126) it was decided that some better system of measuring the occupational mortality of seamen should be devised; the figures in the last Decennial Supplement are the result.

The uncertainty about the numbers of seamen employed from day to day, the many countries in which their deaths are registered, the loose connexion of seamen with their trade, the readiness with which they drop it when tempted by good conditions ashore or are forced out by disabling illness—these and other difficulties are carefully discussed in Appendix B, On the Mortality of Seamen, in the Supplement. (The corresponding section in the 1901 report was signed by Dr. John Tatham; this comment is not signed.) When the numbers employed had been assembled from the returns of the censuses taken in England and Wales, Scotland, Isle of Man, &c., and at sea, the deaths of seamen had to be ferreted out, those of lascars excluded, and finally deaths and populations were arranged by ages, 20–24, 25–34, and up to 65 years, as is done for all occupations. From these figures comparative mortality figures (C.M.F.) are calculated, showing the deaths that would arise among 100,296 persons in the industry, if their ages were distributed as they are in the standard population (occupied and retired civilian males), and if the death-rate of each age-group had been as in the industry in question. In the standard population. 109,296 occupied and retired civilians, 1000 deaths happened in the year, and when the C.M.F. for seamen has been calculated we find the following figures (p. 218):—

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[1] Return of Shipping Casualties to and Deaths on Vessels, 1926. H.M. Stationery Office. 1928. 2*s*.

	Respiratory tuberculosis.		Violence.		All causes.
Occupied and retired civilian males	163·5	..	73·6	..	1000
Occupied and retired seamen ..	221·5	..	389·7	..	1768

In the report 178 groups of occupations are discussed, and it is remarked upon that the seamen's C.M.F. from all causes is higher than that of 171 occupations; to which might have been added the fact that the seven higher all have far fewer members. The report proceeds to note that the rate from phthisis is higher than in 131 occupations, "but that for violence is quite beyond the range of land experience. The highest combined suicide and accident C.M.F. in Table C is 236·3, that for conveyors of material to the coal shaft [72,026 persons], which is about 39 per cent. less than that for seamen."

No death-rates for all seamen are given, but they can be calculated from the figures presented, and thus I have obtained the rates in the two last columns of Table II. In one of these columns are given the death-rates of occupied and retired seamen, ages 20–45 for comparison (crude only, the age-distribution being so different) with the service figures, whereas the other gives the death-rates, ages 20–65, for comparison with the death-rates amongst the merchant marine on active service, the seamen occupied from day to day.

We have not yet discovered the true death-rates of seamen in the merchant service; but everyone who reads Appendix B in the Decennial Supplement will realise that seamen, occupied and retired, have an enormous death-rate from violence, and that their death-rate from disease is also extravagantly high. This may be because they are the only large body of British workers whose health is not under medical supervision. The Board of Trade have made no statement indicating realisation of the situation shown by the Registrar-General. The Board may not realise that under their administration seamen have had much higher death-rates than have most other workers who are under the care and supervision of the Ministry of Health. If one thinks of the care the Board of Trade takes of the health of seamen one cannot but recall the bitter words of Alcestis as she thought of the stepmother with whom she saw her children threatened—ἐχίδνης οὐδὲν ἠπιωτέρα, which may be reasonably translated "no kinder than a cockatrice."

SMOOTH AND ROUGH STRAINS OF BACTERIA.

In the days of Koch it was accepted by most bacteriologists that a given species of bacteria was extraordinarily constant in all its characters. When variations were suspected it was found expedient to ignore them in order that a body of knowledge might be built up as to the behaviour of the less variable cultures, whose features were uniform, and whose morphology and physiology was constant. The occurrence of transmutation from one species to another has not been proved, but during the last 20 years variability in certain directions has been gradually accepted and the correlated changes noted and collected.

E. Weil and A. Felix, H. Braun, P. Bruce White, M. Robertson, and others, working with *B. proteus*, *B. paratyphosus*, *B. tetani*, &c., have shown that motile species of bacteria usually contain two distinct kinds of antigenic and agglutinable substances, associated—the one with the flagella, called the H, the other with the body of the bacterium, called the O antigen. Non-motile cultures were also obtained as variants which contained only the O and no H antigen. By these observations they confirmed the earlier work of Smith and Reagh.[1] The H antigen is responsible for agglutination of emulsions by serum in large, loose, flocculent clumps, formed by the entanglement of the flagella: the O antigen especially when present alone, as in the non-motile forms, is revealed by the agglutination of the bodies in small, dense, coherent grains. In normal cultures, of *B. typhosus* for instance, the two substances are present and by varying independently may affect the results of agglutination and other serological tests, since each has its appropriate and independent antibodies. Differences in one or other of these two antigens are responsible for the distinctions between types in the Salmonella group. The H antigen is not demonstrable in emulsions of bacteria which have been heated at 100° C. for one-half to two hours, but the O is thereby unaffected. On the other hand, changes in the O antigen alone are associated with the peculiar serological behaviour of the so-called "rough" variants derived from cultures of certain bacteria; the H antigen remaining unaltered. Indeed this change in the O, sometimes called the somatic antigen, is the main distinction yet recognised between the behaviour of the "rough" and "smooth" strains on which so much work has recently been done. This work dates from 1920, when Arkwright[2] showed that the spontaneously agglutinable variants which could be isolated from old cultures of normal strains of *B. typhosus*, *B. dysenteriæ*, &c., by selecting colonies of peculiar appearance on agar, also had special serological characters indicating considerable deviation from the type in their antigenic content. He called the normal strains, which made turbid growth in broth and from which good permanent emulsions could be made in salt solution, the smooth or S. form, because the round, dome-shaped colonies were shiny on the surface; the colonies of the spontaneously agglutinating (rough) form were irregular in surface and outline. The rough (R.) form could not be made into a permanent emulsion in salt solution, unless the content of salt was reduced to 0·4 per cent. or sometimes even to 0·1 per cent., and broth cultures instead of being turbid became clear with a large, clumped deposit. The R. colonies were not always typically jagged in outline, and shagreened on the surface, but might only appear dull by reflected light, opaque and coarsely granular under the low power. Serum made from the R. form did not agglutinate the S. form, and serum from the S. had only slight action on the R. emulsion. Absorption with R. emulsion removed any R. agglutinins that were present in the S. serum, without affecting the S. agglutinins. A culture might contain pure S. or R. forms only, or a mixture of the two in varied proportions. Very similar observations have since been made on many strains of *B. dysenteriæ*, *B. typhosus*, *B. coli*, Salmonella, and so forth.

The change from the S. to the R. form is usually independent of any alteration in motility. Moreover, as has been noted above, the results of experiments on agglutination and absorption of agglutinins and on the production of agglutinating sera indicate that the change from S. to R. is concerned only with the O or somatic antigen and does not involve any alteration in the H or flagellar antigen.[*] The smooth somatic appears to be changed into the R. somatic antigen. Schütze[3] and P. B. White[4] also showed that strains which differed widely when smooth often had close affinities in the rough form, since this appeared to have lost the specific S. antigen. The independence of the two changes, from H to O and from S. to R. may be shown by obtaining the following four variants from a single motile strain: (1) normal or smooth motile, containing H and S somatic antigens; (2) rough motile, containing H and R. somatic antigens; (3) smooth, non-motile, with only S. somatic antigen; and (4) rough non-motile, with only R. somatic antigen. The permanence of these variants is still a matter of uncertainty. They may all four remain unchanged through many subcultures, but the tendency to revert or change further varies with the strain. Broth cultures of S. tend to change to R. if not subcultured for many days. R. cultures, if free from S. elements, are said to be incapable of reversion, but this is very doubtful.

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[*] In the U.S.A. P. Hadley and others have used the terms S. and O. in a rather different sense to that defined above. S. has been taken to mean the complete normal form whether flagellated or not, and the O. form has been represented as intermediate between the S. and the R. In so doing, these writers ignore the existence and importance of the H. or flagellar antigen. Their usage appears to be connected with a scheme of cyclic changes in bacteria along definite lines, which is not at present generally accepted.

Changes in Virulence and Pathogenicity.

The significance of these variations has not yet been established, though various isolated observations have shown that they may be connected with changes in virulence and pathogenicity at least in some organisms. It has been found by Topley,[5] Goyle,[6] P. B. White, and others, that in Salmonella and *B. typhosus* the R. form is much less pathogenic than the S. In the case of *B. dysenteriæ* this has not been shown, since both S. and R. forms make strong toxin. There is also experimental evidence that vaccines made with the R. form of *B. paratyphosus* A and *B. typhosus* are much less protective than those made with the S. form. When variants of other classes of bacteria have been examined, somewhat similar facts have been elicited. F. Griffith[7] found that by selecting colonies of pneumococcus with a dull surface he could obtain a variant which he called rough and found to be of very low virulence for mice. This form was not spontaneously agglutinable in salt solution.

In America O. T. Avery, M. Heidelberger, H. Reimann, and L. A. Julianelle have determined that there is a change or degeneration of the antigen of pneumococcus in certain variants which have lost their capsule. This "degraded" form they consider identical with the R. form of Griffith. It has lost its type specificity and is non-virulent, but has agglutinins in common with the R. form of other pneumococci.

They have traced this change to the loss of a definite carbohydrate substance associated with the capsule. Julianelle also found precisely similar R. forms of the capsulated *B. pneumoniæ*. It seems probable that a somewhat similar loss occurs in the change from the S. to the R. form of *B. dysenteriæ*, *B. typhosus*, &c., but the chemical work on this latter group has hardly reached so complete a stage. In the case of the Gram-negative intestinal group and of the pneumococcus, and pneumobacillus, the R. form can be produced by growing the S. form in immune serum. M. Cowan found that certain variants of *Streptococcus hæmolyticus* derived from colonies with uneven surface and outline were less virulent than those from smooth-domed colonies, and that the uneven colonies led to growth in broth with a large deposit and a clear supernatant. She therefore called these variants rough on the analogy of *B. dysenteriæ*. Later observations have shown that irregular streptococcus colonies forming clear broth cultures with large deposit may be more virulent than the smooth-looking colonies which form turbid broth colonies (Todd,[8] Andrewes,[9] 1927–28), and that virulent and non-virulent variants of the same culture may have almost indistinguishable colonies. In fact, the results of work on so-called S. and R. variants of streptococci are at present inconsistent and require further work for their elucidation.

It is desirable even at this stage to give the term "rough" uniform significance, and as far as possible to restrict its use to variants with one set of characteristics. The change in the somatic antigen should be regarded as the most essential change in passing from S. to R. This is almost always associated in the Gram-negative intestinal group of bacteria with spontaneous agglutinability in salt solution, but not in distilled water. The appearance of the colonies is usually a valuable guide to the detection of R. variants, but this is not always the case and R. colonies of the same strain may differ in appearance. It is not clear yet how far the variants described above are merely shifting states within the normal limits of the species. The wide affinities of the R. form suggest an approximation to a primitive state from which more definite types have developed. The suggestion that loss of virulence may occur in the body of an infected animal in connexion with change from S. to R. has not yet been established, but this and other questions are receiving attention from the large number of workers now investigating the anomalies of rough and smooth variants.

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THE DAIRY CONGRESS.

THE first three sessions of the Eighth World's Dairy Congress were held at the Central Hall, Westminster, from June 27th to 29th. The Congress has attracted some 2000 delegates representing 42 countries, and the interest shown suggests that the civilised nations of the world are realising that, as Sir George Newman put it, the dairying industry is not only a trade but a service for health. Prof. E. V. McCollum pointed out, moreover, that in countries where dairy animals are abundant the physical development of the population reaches a high standard.

The proceedings on the first day were opened by Mr. Walter Guinness, Minister of Agriculture, who referred to the changes which had been brought about in the last hundred years by urbanisation and the growth of the transport problem. It was possible, he said, that we were now reaching the limits of the distribution of raw milk. The dairy industry in England and Wales was the most important branch of agriculture and the value of its products was about £58,000,000 a year. Dairy herds were increasing and had reached the record figure of 2,800,000. The consumption of milk in England was, however, much too small. Even greater developments with an increased demand would result from public confidence in an improved supply. Mr. J. Maenhaut, President of the National Dairy Society of Belgium, brought greetings from his country, and Dr. F. E. Posthuma, formerly Minister of Agriculture in the Netherlands, described how dairying in Holland had changed from a family industry to a factory business. He held that the owner of the farm should also be part owner of the factory. It was probable that there would be many more milk products in the future. It was necessary to organise both farms and factories on an international as well as a national basis.

The business of the Congress was taken in sections. In the following notes are summarised a few of the numerous communications which had a bearing on public health.

Feeding of Milch Cows.

Mr. R. B. Boutflour (Harper-Adams Agricultural College) drew attention to the fact that an average cow can only efficiently digest 30 lb. of dry food. If it is given 40 lb. its digestive organs are likely to suffer and a diminished supply of milk will result. He emphasised the need to control both the total amount of food and the amount of indigestible fibre and the importance of careful preparation of the cow for her lactation. An adequate supply of water and three milkings in the day produced high yields; many herds now giving an average of 700 gallons per annum could have their output raised by 50 per cent. if attention were paid to these matters. Mr. James Mackintosh (Reading) drew attention to the very varying soils of the districts in which dairying was now carried on, and to the need for adapting the feeds to the crops which could be best grown in the district. Analyses of the district crops was desirable. The use of roots for feeding was chiefly a question of cost. Dr. H. E. Magee (Rowett Institute, Aberdeen) drew attention to the drain on the calcium reserves of the cow caused by heavy milking, and pointed out that if this was not counteracted in the feed and an adequate supply of vitamin D secured at least a reduction of milk, abortion, or tuberculosis might result. An American speaker drew attention to the deficiency of phosphorus in the soil of Minnesota, where adjustments had had to be made for the excess of sulphate of magnesia in the water.

Milk Recording.

Many communications testified to the good work done by milk-recording societies, and it was urged that more could be done through such societies to secure the elimination of dust in the cowsheds and the prevention of tuberculosis. In New Zealand, where the cow and human population are the same—namely, 1,400,000—it was claimed that recording had brought about an increase of 30 to 40 lb. per cow in butter-fat. The milk there is sold according to fat-content. Scotland was mentioned as a pioneer in recording, and there also the creameries pay for milk in proportion to the fat-content. It was pointed out that it is worth while to do the recording twice a day, so that steps can be at once taken to counteract a drop in yield or the beginning of illness. It was also stated that many farmers employed inefficient milkers. One member of the Congress went so far as to suggest the promotion of sweepstakes among the milkers to promote a spirit of competition. Another suggestion put forward was the trial of a longer interval between calvings—e.g., 15 or 18 months. The need for a standardisation of milk records was put forward by Prof. Prawochenski (Poland) and other speakers.

Grading of Butter and Cheese.

From Australia, New Zealand, and Canada came the information that the grading of butter and also of cheese had by instigating competition amongst the manufacturers produced a great improvement in quality. There was some discussion as to the want of agreement in the grading of the same butter before it left Australia and after it reached London, and it was also pointed out that the system of grading might be helped if steps could be taken to enable the consumer to know what grade he was purchasing.

Milk Control and Designated Milk.

Many papers dealt with the question of control of the milk-supply, and there was general agreement that the best control was by the banding together of producers who believed in sound work and realised that success lay in securing the maximum number of satisfied customers. There appeared to be complete unanimity that the cost of control and inspection by the central and local governing bodies was for the good of the whole nation and should be borne by the taxpayer rather than by the ratepayer. Much was said with regard to designated milks in this country. Among the points made were the need for a much greater incentive for the production of Certified Milk and for a change of nomenclature. The titles of the designated milks were admitted to be most misleading, and " Grade A " was frequently thought by the public to be the best class of milk. Mr. Wilfrid Buckley drew attention to the fact that even a recent British Red Cross publication had fallen into this error. Sir George Newman agreed that the present nomenclature was unsatisfactory and asked the Congress to supply a unanimous suggestion for its amendment. He also pointed out, when the usual controversy between advocates of clean milk and pasteurised milk respectively arose, that pasteurisation and the production of clean milk were not really antagonistic aims. Pasteurisation might make dirty milk safe, but it could not make dirty milk clean. Several speakers pointed out that milk in the U.S.A. was graded before it was pasteurised, and others urged that in this country all milk except that from tubercle-free cows should be pasteurised.

Various Milk Products.

As compared with previous national milk conferences, there was evidence of a broader view as to the uses of milk. Captain J. Golding (Reading) said that the Dairy Institute was not sufficiently alert to prevent the waste of milk by-products, such as whey and skimmed milk. The addition of skimmed milk greatly improved bread. Mr. H. E. van Norman (Chicago) said that American bakers were successfully mixing dried skimmed milk with flour for baking in the proportion of 3 per cent. to 8 per cent. Skimmed milk was also being used for the manufacture of biscuits and ice-cream. Mr. F. Rasmussen, Secretary of the International Association of Ice Cream Manufacturers, showed that ice-cream was now an important food in the U.S.A. Nearly as much milk was used to make ice-cream as to make cheese, and the consumption had gone up from one gallon per head per annum in 1905 to about three gallons in 1926. Nearly £100,000,000 was invested in its manufacture. About two-thirds was consumed in the four summer months and absorbed the summer surplus of milk, thus helping to stabilise prices. The ingredients were milk products, plus sugar and flavouring agents, and the average ice-cream contained 22 per cent. of milk solids. The manufacturing associations hoped further to increase the sale by supplying housewives with ice boxes. Prof. A. Mertens (Louvain) said that Belgium was following the lead of America in the matter of ice-cream. Interest in the ice-cream question gave rise to a special session.

The Rôle of the Veterinary Surgeon in the Improvement of the Milk-supply.

Two sessions were devoted to this question. The discussion brought out a strong feeling that biological tests and routine veterinary inspection should be compulsory and universal, and that the veterinary inspection should not be limited in its purpose to the control of tuberculosis, but should be utilised for improving the feeding and hygiene of the cattle. Dr. W. G. Savage estimated that the cost of inspection would be approximately from 1s. 6d. to 1s. 8d. per cow per year, which meant from a quarter to one-third of a million per annum for England and Wales and from £10,000 to £14,000 for his own county of Somerset. This cost was a heavy burden on poor agricultural counties, mainly for the benefit of urban areas. Prof. Porcher said that veterinary inspection was not compulsory in France, but had been made optional for the departments. An able paper by a veterinary surgeon, Mr. Trevor F. Spencer (Kettering), expressed the view that the present legislation as administered was doing nothing to reduce the prevalence of bovine tuberculosis and that a much more determined effort was needed. There was very little regular veterinary inspection. His views (as to the futility of the present administration of the law) were largely in accord with those expressed in THE LANCET last year by Dr. Savage. With a proper effort the expense of dealing with tuberculosis should be a decreasing one year by year. Under present conditions the expense would be a continuous one. Mr. Spencer's paper caused considerable discussion as to whether the local knowledge of the part-time veterinary surgeon outweighed the disadvantage caused by the conflicting interests of his private clients, and also brought out the fact that, while veterinary inspection was not appreciably used in England and Wales, it was in full operation in most of the dairying counties of Scotland. Several speakers blamed the Ministry of Health for failure to encourage the application of veterinary inspection in England and Wales. Most of them were inclined to think that the first step with regard to tuberculosis was the general enforcement of present legislation with an encouragement of designated milks and a gradually increasing stringency of the enactments and that the time was hardly ripe for new legislation or the extended use of the tuberculin test. Mr. Hugh Begg (county veterinary inspector, Lanark) pointed out that 75 per cent. of the tuberculous cows were aged and that more attention might be given to killing off aged cows. Mr. A. Gofton (veterinary inspector, Edinburgh) referred to the insufficient liaison between the departments of agriculture and health, and pointed out that most of the burghs of Scotland had had veterinary inspectors for 25 years. Captain R. Simpson (veterinary inspector, Cumberland) was as optimistic as the Scottish speakers as to the good effects of present legislation in his county. Prof. Ostertag took part in the discussion. A breeder of pedigree stock, timorous as to the use of tuberculin, was promptly answered by another pedigree breeder (Hon. G. Corbett, Ayrshire), who pointed out that it was essential for anyone who produced for export to have tubercle-free herds. He added that they hoped soon to have special accommodation and special prizes at the Highland show for tubercle-free animals. He referred to the danger of infection from manure and mentioned two precautions which he had adopted—namely, double fencing of the fields used by the tubercle-free cattle, and, in the event of reactors being found at the half-yearly testing, the segregation of the two neighbours of the reactor, until it was certain that they were not infected.

Food Value of Milk and Propaganda.

There were many papers on the food value of milk. Prof. McCollum referred to large scale experiments on the gain to American school-children from an extra allowance of milk, and Prof. Pirquet (Vienna), after referring to the similar experience of Dr. Corry Mann and Dr. G. A. Auden in England, mentioned that the use of milk was increasing in Austria. There were many papers on methods of propaganda, and Dr. Ernest Eber (Hungary) moved a resolution for the establishment of a central office in London for the organisation of dairy propaganda throughout the world. This resolution was referred to the Executive Committee. The question of the education of those engaged in the dairying industry produced communications from Dr. Stenhouse Williams, Dr. Otto Gratz, of Hungary, and Dr. F. Zaribnicky, of Vienna.

The Congress also held sessions in Reading and Edinburgh; many tours of professional interest to its members are being made, and the Congress will not conclude until after the meeting of the Royal Agricultural Show at Nottingham, July 10th to 12th.

Conclusion.

The arrangements for the sessions and tours brought credit to the organising ability of the secretary, Mr. Arthur D. Allen, and the tone of the discussions justified the contention of Mr. Walter Guinness at the outset, that although the delegates to the Congress were competitors and in the markets of the world, they were coöperators in education and research.

LEAGUE OF NATIONS.

AN INQUIRY INTO THE RADIOTHERAPY OF CANCER.

THE Subcommission of Experts charged by the Cancer Commission of the League of Nations with the study of Radiotherapy of Cancer held its first preliminary meetings on June 18th and 19th. These were attended by the President of the Cancer Commission, Sir George Buchanan, senior medical officer at the British Ministry of Health.

This subcommission included the following experts in radiology and gynæcology:—

Prof. Cl. Regaud, Director of the Radium Institute of the Curie Foundation, Paris (President).

Dr. C. Comyns Berkeley, Director of the Middlesex Cancer Charity Hospital, Gynæcological Service.

Prof. Döderleim, Director of the Gynæcological Clinic of the University, Munich.

Prof. W. Lahm, Director of the Laboratory Research Work, the State Gynæcological Clinic, Chemnitz.

Prof. van Rooy, Director of the Gynæcological Clinic of the University, Amsterdam.

M. R. Ferroux, Chief of the Therapeutical Works at the Curie Foundation, Paris.

Prof. Voltz, Gynæcological Clinic of the University, Munich.

Investigator: Dr. Janet E. Lane-Claypon, attached to the Departmental Cancer Committee of the Ministry of Health, London.

Prof. G. Forssell and Dr. Heyman, of Radiumhemmet, Stockholm; and Prof. Pestalozza, Director of the Gynæcological Clinic, Rome, were absent.

The subcommission was appointed in consequence of a report by the Cancer Commission to the Health Committee of the League in May last, in which emphasis was laid on the importance of collecting data from different sources regarding the methods of radiological treatment and their modern results. In addition, it was suggested by the President of the Cancer Commission that it might be well for the subcommission to take cognisance of the following points: 1. Available supplies of radium. 2. The centralisation of radium in each country for the supply of the smaller clinics and individual practitioners, in the event of this being considered desirable. 3. The form of record which should be kept with the view of comparing the results obtained in different countries after some five years' observation after cessation of treatment.

The subcommission first considered in detail the nature of the information to be collected and the sources to which application should be made. It was considered necessary to obtain individual details of a, numerically, large series of cases of cancer of the uterus divided according to their treatment (*a*) by radium, (*b*) by X rays, or (*c*) by both—taking account only of those cases in which the treatment was completed more than three years ago, and in which the after-histories were traceable; it will also be necessary to have statistical data of all observed cases in each of the clinics taking part in the inquiry. The details to be given were settled, but the subcommission left the preparation of model forms, cards, &c., to the Health Secretariat, which for this purpose will have the advice of Dr. Lacassagne (Paris), Prof. Voltz (Munich), Dr. Heyman (Stockholm), in addition to that of Dr. J. E. Lane-Claypon, who has been appointed the technical inquiry officer of the Commission for this purpose. The same group of experts will assist in the collection and codification of the replies received.

The clinics and institutions to be applied to are to be limited in the first instance to those which possess a sufficiently large experience, and their assistance may be invited either directly or through national health administrations or other appropriate national organisations. As some cancer or gynæcological clinics have already expressed their willingness to coöperate in an inquiry whose practical value they recognise, it is hoped that those data can be collected without delay. It is intended that the results when analysed should be submitted in the form of a report to the Committee, and published in due course. While the clinics or institutions chosen will be specially requested to follow the system of record proposed to them for purposes of international comparison, they will also be invited to summarise their own observations and views regarding the efficiency of radiological treatment in any manner which they consider may be useful to the Commission. The inquiry as such is to be limited to uterine cancer (cervix and body), but accessory information regarding cancer of other gynæcological sites may be supplied for separate study.

On the broader questions relating to the treatment of uterine cancer by radiology, the President submitted a series of considerations which, after a general discussion, were adopted by the subcommission as representing the most important directions to which its future discussions should be directed, and on which definite recommendations should be made in due course to the Health Committee with a view to publication. Among these considerations were: 1. Propaganda among doctors and the general public in order to ensure the early discovery and early and correct treatment of cancer of the uterus. 2. Increase in the number of consultation centres. 3. Organisation of centres for microscopic analysis in order to ensure early diagnoses. 4. Recommendations for the organisation of the correct treatment of the disease. 5. Recommendations for the radio-therapeutical equipment of clinics. 6. Disadvantages of out-patient treatment. 7. Recommendations for the compilation of reliable statistics. 8. Recommendations for special scientific research.

The Commission also noted, as subject for inquiry, the available supplies of radium and the need for an authoritative opinion as to the advantages and drawbacks of distributing radium or radium emanations to hospitals and individual practitioners.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the 1927 statistics of six districts :—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Wiltshire C.C. .. (299,500)	15·4	12·1	0·75	1·41	2·4	2·0	51	2·3	3·5
Sunderland C.B. (162,700)	22·4	13·8	1·38	1·10	3·2	1·8	94/41	14·2	4·7
Edmonton U.D. (71,279)	17·8	10·9	1·23	1·0	2·4	2·1	61	7·1	0·8
Doncaster R.D. (41,760)	24·1	9·8	0·76	0·74	2·2	0·8	76	7·9	3·9
Ramsgate B. .. (30,100)	15·0	15·0	1·10	2·0	2·9	1·7	69/33	4·0	0·0
Yeovil B... .. (16,500)	14·7	10·9	0·54	1·09	1·9	2·2	49/37	0·0	8·2

Wiltshire.

Dr. Claude Tangye says there are still two obvious gaps in the county administration. The first is that children, apart from special cases, do not between the age of 1 year and school age receive the supervision which is urged by the Ministry. Provision has been made in the current estimates for an increase in the health visiting staff for this purpose. The second gap is in the tuberculosis scheme. Hospital facilities both for pulmonary and non-pulmonary tuberculosis are satisfactory but, owing to the inadequacy of the county medical staff, the supervision of cases in their own homes is only partially carried out in the Swindon area, which perhaps needs it most, being densely populated and industrial in character.

The deaths attributed to influenza numbered 313 and exceeded those from bronchitis (225) and pneumonia (188). The epidemic of influenza in the early part of the year accounted to a large extent for the higher death-rate as compared with the previous year, and also caused the closure of 159 schools. With modern ambulance facilities the present number of small isolation hospitals in the county could be reduced. The county council takes the responsibility of dealing with all cases of small-pox which may occur within the county, and the new hospital for the northern district at Ogbourne St. George is now complete.

The water-supply of the towns is good, but many of the villages are dependent upon wells which have become hopelessly polluted and others are dependent upon rain water only. The local authorities are awakening in the matter, and during the year inquiries were held with regard to the water-supply of three of the rural districts. In addition, the water-supply for the parish of Ashton Keynes, chiefly derived from numerous polluted shallow wells, is thought to be associated with the prevalence of intestinal worms among the children, an opinion which is said to have been confirmed by an inspector of the Ministry. As a result the rural district council is considering a scheme for the water-supply of this village. Pure water for these villages and for the farms is doubly important. In the first place, Dr. Tangye says ordinary typhoid fever is making its reappearance. There were 12 notifications during the year with three deaths. In the second place, compliance with the new Milk and Dairies Order is impossible without a pure water-supply, and there is, of course, a great milk industry in the county. The sewage disposal works have also received considerable attention. Of the effluents from 13 urban districts, 12 were classed by the analyst as fair or good, and one as poor. Of the effluents from 15 rural district works, nine were classed as fair to good, while two are described as not good, two as bad, one as very bad, and one as very foul. The Staverton Milk Factory pollutes the Avon in the Melksham district and a very foul effluent is from the Netheravon works, which are under the War Department.

Council houses have been erected in every district except Malmesbury U.D. and Chippenham R.D., and the Chippenham R.D. Council have now decided to build. The Housing (Rural Workers) Act came into force on Dec. 15th, 1926, and up to the end of 1927 20 applications were received. In eight cases grants were approved totalling £1455, and a loan of £100 was made, but two of these applications were withdrawn. Of the remaining 12, ten were refused, one is under consideration, and a grant of £100 was made in 1928 for the other. This Act, says Dr. Tangye, provides the first real opportunity open to county councils for direct help in the improvement of housing conditions, and few counties have wider scope for its operation than Wiltshire.

The follow-up of tuberculous milk samples reported by outside authorities is doing something to eliminate tuberculous cows from the Wiltshire herds. Thus, 22 complaints received resulted in the inspection of 32 farms and the discovery of 19 tuberculous cows. Reports from the London County Council of the premature death of many of the inoculated guinea-pigs led to an investigation of the conditions at other farms with the discovery of dirty conditions of the udder and abscesses, and incidentally of one more tuberculous cow. No satisfactory explanation, however, was found to account for the deaths of the guinea-pigs. The county council is also taking samples of milk for bacteriological examination, and following up bad results by veterinary inspection of the farms. In this way four more tuberculous cows were weeded out.

The county council is offering the assistance of its medical and nursing staff to local authorities, who are prepared to undertake the immunisation of children against diphtheria. Seven cases of encephalitis lethargica, six of which proved fatal, were notified, as compared with 20 in 1926. The county council have decided to pay the cost of a locum tenens for one month to enable a midwife, on the application of a local nursing association, to attend a post certificate course; and they have also arranged to supply pelvimeters at a special rate to the midwives for antenatal work. The midwives sent for medical aid in 26 per cent. of their cases. The doctors' fees paid by the county council amounted to £669, of which £244 were recovered from the patients, the balance being divided between the county rate and the Government grant.

The health visitors inspect boarded-out children for all the boards of guardians in the county except three. Dr. Tangye regrets that this scheme has not been accepted universally, seeing that boards of guardians do not employ, as a rule, an experienced nursing staff for this work.

Sunderland.

Dr. A. S. Hebblethwaite presents his first annual report, having been in charge during the last seven months of the year. The unprecedented rainfall during the summer caused flooding in many of the low-lying areas and drew attention to the inadequacy of the sewer accommodation. Housing conditions in the older and more congested parts of the borough have been improved by the number of new municipal and private enterprise houses built, but the problem of housing the working classes in less crowded houses near their work remains. The work in the light treatment clinic has been increased and arrangements have been made for treating children under the age of 5 years.

Dr. Hebblethwaite especially draws attention to the heavy death-rate from respiratory diseases. Tables are given, which show that since 1918 the pneumonia death-rate in Sunderland has been more than 50 per cent. higher than the English rate and that the bronchitis death-rate in Sunderland has been double the English rate. Of the 249 deaths from pneumonia, 140 were children under the age of 5. Dr. Hebblethwaite hopes that more children suffering from pneumonia will be accommodated in the municipal hospital in future.

Sunderland is now, practically speaking, a water-carriage town, and it is hoped that before long a standard dustbin will be provided for every house under the local Act of 1927. There are now only eight cowkeepers within the borough, keeping approximately 120 cows which are inspected quarterly by the veterinary surgeon.

There were 47 cases of small-pox notified with one death at the age-period 45–65. An outbreak at a common lodging-house with 90 male inmates caused considerable trouble owing to the refusal of vaccination by the contacts. The first case was removed on Sept. 13th, the second on Sept. 17th, the third on Sept. 30th, the fourth on Oct. 8th, the fifth on Oct. 9th, and the sixth and seventh on Oct. 10th. After each removal thorough disinfection was carried out and the lodging-house was closed to new applicants from Sept. 13th. After the last removal most of the contacts who needed vaccination accepted it. Eight cases were notified from the Highfield Poor-law Hospital, and the remaining cases occurred in various parts of the borough. There were 11 notifications of encephalitis lethargica, and ten deaths from this disease, five of which were of cases notified in the previous year. Of the 11 cases notified in 1927, five cases died in 1927, one in 1928, four are still suffering from some disablement, and one has recovered.

Edmonton U.D.

Dr. H. W. Harding describes his district as one of the dormitories of London, from which many of the inhabitants travel to town daily. The greater portion of Edmonton is in the valley of the Lee and only slightly higher than its waters, and Dr. Harding suggests that such a site may be responsible for throat affection, enlarged tonsils, and endemic diphtheria. Housing conditions are far from satisfactory. There is still overcrowding and there are various blocks of houses which should be dealt with as soon as circumstances permit. The day nursery registered 7000 attendances. The cost was about £960, of which about £220 was paid by the mothers in fees. The nursery also takes, as residents, the children of mothers who have been taken from home owing to illness; and the full number of 180 school-girls attended the mothercraft classes during the year. The Education Committee contributes £50 to the funds of the nursery in return for the holding of these classes. The joint orthopædic clinic, which provides treatment for crippling defects in children under 5 years and of school age, is conducted by Mr. J. B. Barnett, of the Royal National Orthopædic Hospital, and operative treatment, when necessary, is carried out at Stanmore Hospital. By arrangement with the guardians the maternity wards of the North Middlesex Hospital are used for municipal patients. The fee charged to the council is 6*s*. per day and the order for admission is signed by Dr. Gertrude Outram, who is in charge of the antenatal clinic. The same hospital has also provided, since early in 1927, artificial sunlight treatment for cases of rickets and marasmus.

Doncaster R.D.

Dr. A. B. Dunne says the needs of the district have long since outgrown the existing accommodation of the Doncaster Royal Infirmary and a contract has been signed to build the first block of the new infirmary on a spacious site on the Thorne-road, Doncaster. Dr. Dunne refers to a difficulty caused by speculators buying land and builders erecting a large number of small houses with the assistance of the Government subsidy. These houses have been passed by the council with the drainage emptying into cesspools and the duty of cleansing the cesspools falls on the owner or occupier. The council are now taking steps to meet the difficulty by instituting sewage disposal works for the respective parishes, but the council's schemes must necessarily come later than the building schemes. Dr. Dunne also refers to the increase of atmospheric impurities owing to the growing number of colliery stacks and miners' houses. He suggests that the miner's house produces an exceptional amount of domestic smoke owing to the "home coal" allowance of 1 ton per month to each coal-miner. He looks to the chemists to provide a cheap and smokeless household fuel as a remedy. Dr. Dunne also wonders, in view of universal baths, for how many years the red sandstone can be tapped without encroaching on its capacity, and states that the level of the water in several of the deep boreholes has been lowered. There were 118 notifications of small-pox with one death. The one death was that of a woman of 61, who had been vaccinated in infancy and contributory causes of her death were phlebitis and "petit mal."

Ramsgate.

Dr. W. J. Bannister reports a rainfall of 30·1 inches and a sunshine record of 1647·1 hours. He enumerates the advantages of Ramsgate as a health resort and mentions that a certain number of parents take up their residence in Ramsgate with the object of restoring their delicate children to robust health. From the high infant mortality-rate and the school report one gathers that insufficient attention is given to the children of the normal population. There are nine public elementary schools, of which only the two provided by the education authority and one of the "non-provided" are satisfactory, while in the case of the other six faulty design and unsuitable situation leave much to be desired. This state of affairs, no doubt, makes Dr. Bannister's plea for an open-air school and open-air classes all the year round the more urgent. Verminous conditions give trouble in the schools. There are no school baths and there is no organiser of physical training. Dr. Bannister also pleads for the formation of classes with a view to corrective exercises for postural defects. Each of the four health visitors carries out all the health visiting and school work in the area allotted to her. At the end of the year 198 of the 352 houses in the council's scheme had been provided and contracts had been made for the erection of 38 parlour and 104 non-parlour houses, of which the latter will help to remove the pressing need for housing accommodation at low rentals. During the year an improvement scheme for an unhealthy area was approved by the Ministry.

Yeovil.

Dr. C. W. Gee reports that the staple industry is the manufacture of leather gloves, including all processes from the preparation of the raw hides. The water-supply is not sufficient during dry periods for the area supplied, and the council have obtained powers to sink a new well in the greensand at Cattistock, from which an additional daily supply of 500,000 gallons is expected. Very few houses in the borough are provided with sanitary dustbins and a great nuisance is caused by the blowing about of refuse on windy days.

There were 243 births and 52 expectant mothers attended the antenatal clinic. The general standard of housing is fairly good, but there are many worn-out houses which cannot be made reasonably fit for habitation and which would be condemned under normal conditions. Of 191 new houses erected, 168 formed part of a municipal scheme.

SCHOOL MEDICAL SERVICE.

Name of district.	No. on roll.	Average elementary school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.†
Shrewsbury	3,900	—*	1,575	6,586	10·3
Bootle ..	12,010	10,804	3,751	12,705	22·5
Taunton ..	2,827	2,616	793	2,404	18·4

* Not given. † Excluding dental defects and uncleanliness.

Shrewsbury.

By the reorganisation of his present nursing staff and the addition of another nurse Dr. A. D. Symons proposes to conduct an increasingly intensive campaign against personal uncleanliness, which perhaps more than any other single condition indicates parental ignorance or neglect.

This reorganisation will coördinate the maternity and child welfare work with the school service by enabling each nurse to carry out all the nursing duties of both services in her own district. In summarising the results of his work for the year Dr. Symons has taken the opportunity of pointing the way to achieve further improvements in the health of the children of Shrewsbury. His proposals include better ventilation and lighting in the schools and bigger playgrounds with shelters for open-air classes, and he has published a special memorandum on "The School Building in Relation to Health," in which his ideas are clearly set out. The provision of milk and cod-liver oil for necessitous children has been justified by their increase in height and weight. The need for further dental assistance will be met by additional dental sessions. Close coöperation exists between the S.M.O. and the organisers of physical training not only in the arrangement of games and sports, but in the supervision of remedial exercises where these are necessary. Acknowledgment is made of the cordial help of teachers, attendance officers, and voluntary associations. That Dr. Symons's good work is appreciated by the parents is shown by the increasing numbers who attend medical examinations and clinics.

Bootle.

Dr. F. T. H. Wood, S.M.O. and M.O.H., in his introduction to this report. points out that the functions of the local education authority go beyond the promotion of the mental development of the child and are actively concerned with his health and physical development. Medical inspection is conducted for the most part by Dr. Purser Davies, who also deals with maternity and child welfare. The tuberculosis officer, Dr. R. Hannah, also helps in medical inspections and at a minor ailment centre. Dr. Wood himself occasionally conducts routine examinations and undertakes the medical work in connexion with the special classes and the Mental Defective Act cases. Meals are provided by the school canteen committee, of which the S.M.O. is a member; this committee has control of a useful fund for providing needy children with clogs during the winter months.

The remedial exercises clinic is supervised by the S.M.O. with the coöperation of an orthopædic surgeon; this clinic deals with mouth-breathers and cases of minor spinal curvature, as well as more definite pathological conditions. The special interest taken by the local authorities in physical development is shown in a further grant of £200 for expenditure on apparatus, and the appointment of a special (playing fields) subcommittee to find suitable playing accommodation. A striking improvement in personal cleanliness and in the attendances at the minor ailment centre is recorded this year, also a reduction in the percentage of most of the physical defects. The hygiene of the mouth and teeth is the subject of a booklet which has been prepared by the Dental Board and circulated among head teachers with excellent results in this town. Teachers have been zealous in passing on information to the children, with the result that further dental assistance will soon be called for. It has not yet been possible to establish any special schools, but the children in the special classes for the dull and backward have been under the supervision of the S.M.O. and all have been individually examined.

Taunton.

In a small town facilities such as clinics and special schools are difficult to establish, but a compensating advantage is that since nearly all the health work is directly under one person coördination is excellent, and intimate contact with parents can be secured. In Taunton Dr. J. Allen, who is in charge of public health, school inspection, and infant welfare clinics, gets a high percentage of parents (72 per cent.) to attend the medical inspections. Moreover, the fact that one person serves both as school nurse and attendance officer leads to the early discovery of infectious and other diseases. The dentist, Mr. A. J. Percy, states that both parents and children are becoming more favourably disposed toward the idea of having teeth filled rather than removed. This preference is a feature of the practice at Taunton, for with permanent teeth the fillings (594) are over eight times as many as the extractions (72). The dentist anticipates that every year 50 per cent. to 60 per cent. of the children will need treatment; but in view of the thorough and prompt work now being done some reduction may, we hope, be looked for.

Taunton is spared some of the disadvantages of a small town, since it is the headquarters of several institutions belonging to the county of Somerset—for example, the orthopædic clinic of the county council is open to the children and the infants of the borough, as is also the tuberculosis dispensary. The occupation centre of the Somerset Association for Mental Welfare is available for low-grade mentally defective children. Dr. Allen mentions that this valuable institution is in urgent need of more local support.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 23RD, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 230 (last week, 282); scarlet fever, 1716; diphtheria, 969; enteric fever, 54; pneumonia, 769; puerperal fever, 47; puerperal pyrexia, 100; cerebro-spinal fever, 10; acute poliomyelitis, 9; acute polio-encephalitis, 2; encephalitis lethargica, 31; dysentery, 8; ophthalmia neonatorum, 117. *No* case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified from the following 21 counties: London, 11 (Bermondsey 1, Hackney 1, Southwark 1, Wandsworth 8); Bedford, 6 (Bedford 2, Luton 4); Derby, 28; Devon, 1; Durham, 62; Gloucester, 2; Hertford, 1 (Bishop's Stortford); Lancaster, 11; Middlesex, 1 (Wembley); Norfolk, 1; Northampton, 4; Northumberland, 14; Nottingham, 6; Soke of Peterborough, 1 ; Stafford, 16 ; Surrey, 1 (Godstone) ; Warwick, 2 (Coventry) ; Worcester, 1 ; Yorks, North Riding, 4 ; West Riding, 28 (last week 56) ; Glamorgan, 7 ; Monmouth, 22.

The numbers of cases of small-pox in London have declined during the last three weeks, the figures being 49, 24, and this week 11.

The number of patients in the Infectious Hospitals of the Metropolitan Asylums Board on June 26th-27th was as follows : Small-pox, 69 under treatment, 7 under observation ; scarlet fever, 1781 ; diphtheria, 1979 ; enteric fever, 18 ; measles, 600 ; whooping-cough, 152 ; puerperal fever, 21 (plus 19 babies) ; encephalitis lethargica, 68 ; poliomyelitis, 1 ; "other diseases," 24. At St. Margaret's Hospital there were 14 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were 6 (0) deaths from enteric fever, 34 (8) from measles, 5 (4) from scarlet fever, 48 (7) from whooping-cough ; 29 (8) from diphtheria, 36 (12) from diarrhœa and enteritis under two years, and 31 (3) from influenza. The figures in parentheses are those for London itself.

The six fatal cases of enteric fever occurred at Hornsey, Bath, . Ashton-under-Lyne, Huddersfield, Halifax, and Newcastle-on-Tyne.

The number of stillbirths registered during the week was 258 in the great towns, including 38 in London.

Correspondence.

"Audi alteram partem."

THE EARLY DIAGNOSIS OF CANCER OF THE COLON AND RECTUM.

To the Editor of THE LANCET.

SIR,—Dr. A. F. Hurst, in the admirable paper published in your issue of June 23rd, puts forward a plea for a definite diagnosis of malignant disease of the colon with view to early, and therefore probably more successful, operation. But even when the patient first complains of suspicious symptoms it may be already too late, and all physicians must have met with cases in which the disease had certainly been in existence for a long time without very marked symptoms. A striking case in point recently occurred at the Italian Hospital. A woman, aged 49, was admitted under my care on June 23rd. She was well nourished and had "enjoyed good health" all her life. She had no abdominal symptoms whatever until a week before admission, when she began to suffer from flatulence and constipation, which became complete two days before admission. The abdomen was somewhat distended, but not tender or rigid ; there was no fever, no pain, no vomiting, the pulse and general condition were good. Per rectum nothing could be felt. Castor oil and high enemata failed to produce any evacuation and, since the patient vomited once, and colicky pains appeared, laparotomy was performed by Dr. Lwow, the resident medical officer. On opening the abdomen, gas escaped and free purulent fluid was found. A mass of malignant disease completely constricted the upper part of the sigmoid and a mass of glands in the pelvic mesocolon. The bowel was ruptured above the seat of the disease ! A provisional diagnosis of sclerosing cancer in some part of the intestines, with impaction of fæces above, had been suggested before the operation, but no one who saw the case was prepared for the gross and catastrophic lesions which must have existed for a long time previous to her admission without causing any symptoms to arouse the least suspicion.

I am, Sir, yours faithfully,
T. VINCENT DICKINSON.

Sloane-square, S.W., July 2nd, 1928.

A SIMPLE HOOKWORM LARVICIDE.

To the Editor of THE LANCET.

SIR,—The letter of Col. Clayton Lane in your issue of May 19th on the effect of common salt in destroying hookworm larvæ recalls an investigation carried out by me some seven years ago in an Indian salt mine.

As part of an inquiry ordered by the Government of India into the incidence of hookworm disease amongst miners (of all sorts), it became my duty to report upon the health of the miners employed in the Khewra Salt Mines, which are located in the Salt Range in the north of the Punjab. The health of this community was notoriously bad, and it was generally assumed that ankylostomiasis was mainly, if not solely, responsible. I accordingly set up a laboratory at Khewra and made a systematic examination of the health of the community, which included an examination of the fæces of a large proportion of the miners, and of their wives and families. To my profound astonishment, although the majority of the miners were found to be infected with one or more helminths, not a single ovum of an ankylostome worm was detected. It is now known somewhat more definitely than in the year 1921 that ankylostomiasis is not a common disease in the Punjab ; but, as a result of recent observations at the Mayo Hospital, Lahore, at the Medical School at Amritzar and, more especially, of the helminth survey of India carried out by Dr. Chandler, of the Calcutta School of Tropical Medicine, it has been established that infection with ankylostome worms (not necessarily associated with clinical signs of ankylostomiasis) occurs with some frequency in the hill tracts of the Punjab and somewhat sparsely amongst the inhabitants of the plains. This being so, it is even more of a matter of surprise that a community, working under extremely unhygienic conditions and in an environment apparently favourable to infection (on account of great heat and humidity, work has to close down in the mines during the monsoon months, July to September), should escape completely. I made the suggestion in my report, which unfortunately was not published and which is not now available, that the heavy impregnation of the soil with common salt might exercise an inimical influence upon the hookworm larva during its extra-corporeal phase, and that this circumstance might be responsible for the remarkable immunity of the miners from ankylostomiasis.

Malaria was proved to be the chief cause of ill-health of the miners at Khewra, and no attempt was made to follow up the above suggestion or to determine, by experiment, whether it was well founded ; but in view of the experimental work of Lambinet and others, to which Colonel Clayton Lane alludes, it seems certain that transmission of infection would be impossible in a soil heavily impregnated with salt and that this circumstance might account for the absolute freedom of the Khewra miners from infection. The free use of common salt in coal and other mines, where ankylostomiasis constitutes a menace to health, would thus appear to constitute, as Colonel Clayton Lane remarks, a simple and effective remedy for eradicating hookworm infection from mines ; but surely one may go further and say that the use of common salt would prove equally valuable in all areas, such as the vicinity of latrines, where infection is peculiarly liable to be contracted.

I am, Sir, yours faithfully,
C. A. GILL.
Lt.-Col., I.M.S.

Simla, June 14th, 1928.

PERICARDIAL KNOCK.

To the Editor of THE LANCET.

SIR,—The case of pericardial knock described in your issue of June 16th by Dr. W. A. Lister recalls a certain soldier, whom I saw, in consultation, at the Bermondsey Military Hospital during the war. On approaching the patient, and when still some yards from the foot of the bed, both his heart sounds could be heard clearly. There was no marked constitutional disturbance, so that the heart's action was not accelerated. The result was that the effect produced on the ear resembled that of a grandfather clock. The history was that this phenomenon had been observed for nearly two days. On examining the chest there was evidence of the presence of fluid on the left side, and an exploratory puncture was advised. The chest was not, however, explored, for a few hours later a bronchial fistula developed; the patient coughed up the contents of an empyema, and the heart sounds became normal. The fact that the conduction of the heart sounds disappeared when the pressure of the empyema was removed gives support to Lister's view as to the cause of their conduction—viz., that the sounds arise in the left pulmonary artery, that they are due to tension or distortion of that vessel, thus partially obstructing it, and that they are analogous to the sounds heard when estimating the blood pressure by auscultation. If this is the right explanation, the term "pericardial knock" seems to be a misnomer.

All the other cases have been in association with a wound of the chest—indeed no such case, prior to Lister's, appears to have been recorded in civilian practice. The loudness of the sounds also renders the Bermondsey case notable, for only in Munden's[1] patient, whose heart sounds could be heard 6 or 8 ft. from the chest, and for an hour only before death, was anything like the same loudness recorded. Maynard Smith[2] states that the sounds may sometimes be heard when standing at the foot of the bed, but he makes no reference to their having been heard further off than this. Finally, Rees and Hughes[3] state that the sounds could not be heard at a greater distance than a few inches from the chest in any of the cases which they had collected.

I am, Sir, yours faithfully,

H. E. SYMES-THOMPSON.

Wimpole-street, W., June 27th, 1928.

VARICOSE ULCERATION: ULTRA-VIOLET LIGHT AND UNNA'S PASTE DRESSINGS.

To the Editor of THE LANCET.

SIR,—In answering Dr. Weinbren's criticism in THE LANCET of June 23rd, of my paper on varicose ulcers in the number of May 5th, I must express my regret that some of the points at issue relate to figures in the statement of details (Table C) which unfortunately had to be omitted for reasons of space. This table, as was noted in a footnote to my article, is available for inspection by anyone interested.

1. It is stated in my paper that a relatively large proportion of suberythema doses were given because the ulcers having them "on the whole ran a more favourable course than those having stronger doses." In other words, the smaller percentage of stronger doses is directly referable to their inefficacy. In those cases in which they were used (in 83·8 per cent. of 31 cases for the air-cooled, and 19·3 per cent. for the water-cooled lamp) they were abandoned after what was, in my judgment, a reasonable trial of consecutive doses when, and only when, there appeared to be no justification for their continuance. Since Dr. Weinbren does not give the total number of doses concerned in his calculation, the percentages convey very little. Ten per cent. of doses with the water-cooled lamp in a total of, say, 1000 doses, would represent a very appreciable trial, whereas 10 per cent. of 10 doses would indeed be negligible.

2. The ulcers were treated twice or thrice weekly except, as stated, in the few cases in which an unusually strong dose was given. The figures of duration of the light treatment in the addendum have doubtless misled Dr. Weinbren, because they relate to the whole period during which no treatment other than ultra-violet was given, and they therefore include in certain cases deliberately planned intervals for observation between sets of consecutive doses. It was always possible that intermittent treatment would be actually beneficial when the results of continuous treatment were unsatisfactory. The scheme of dosage would have been more clearly seen had I indicated when these intervals occurred, even at the risk of making the table still more cumbersome. Without this indication an accurate analysis on the lines attempted by Dr. Weinbren is in no way possible.

3. I greatly regret the oversight which led to the omission of the unmeasured ulcer, which "covered three-quarters of the leg," from the irradiated series. The addendum shows that this ulcer was not treated with Unna's paste; the surgeon-in-charge advised amputation.

I can see no indication in the report that the "worst ulcers" were treated with Unna's paste. If this assumption is based on the fact, as stated, that the area of the largest ulcer in the Unna series was greater than in the light series, then the omission to which I refer above is sufficient to upset it. Since the figures of the average size which Dr. Weinbren gives "may," by his own admission, include whole ulcers, where only a part was treated, I can hardly accept them. In any case, my work has not given me the impression that the worst ulcers, within limits, are necessarily the largest. The rate of healing may be more rapid in large than in small ulcers, and the last stages are often the most intractable.

4. The ambulatory cases receiving irradiation wore no support other than their ordinary bandages, in order that the issue might not be confused by the simultaneous adoption of two lines of treatment. The evidence of the healing which occurs with Unna's paste clearly shows the fallacy involved in attempting to judge the effect of synchronous treatment when the veins are well supported. Dr. Weinbren himself, in the last number of the *British Journal of Actinotherapy* (I quote from memory, as I am away from home), expresses the opinion that the rate of healing under ultra-violet light is to some extent dependent on the use of adjuvant factors. I agree with him. That is what my experience has taught me; but his adjuvant factor is my essential factor.

I am, Sir, yours faithfully,

June 24th, 1928. DORA C. COLEBROOK.

REMOVAL OF THE RIGHT CEREBRAL HEMISPHERE IN MAN.

To the Editor of THE LANCET.

SIR,—In your interesting annotation in THE LANCET of June 30th (p. 1337) it is stated that in Dandy's successful case of removal of the right cerebral hemisphere "hearing remains normal in both ears, a finding which disposes of the assumption that there is cortical representation for hearing in the right temporal lobe." This inference, as I understand it, is not deducible from the facts which really go to support the assumption or, rather evidence, that there is cortical representation on each side for both ears. In support of this I would quote the late Sir Frederick Mott's case of a woman in which a vascular lesion of the left cortical centre led to word-deafness, from which she recovered and got married. She unfortunately sustained a vascular lesion of the right cortical centre and only then became quite deaf. Karl Grabe's pathological investigations on central disturbances of hearing[1] showed that in damage to one cortical centre hearing for speech is only slightly diminished, the diminution being more marked in the ear opposite to the lesion.

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[1] Munden, W. H. P.: Brit. Med. Jour., 1918, i., 175.

[2] Smith, S. Maynard: Ibid., 1918, i., 78.

[3] Rees, W. A., and Hughes, G. S.: THE LANCET, 1918, i., 55.

[1] Zeits. f. Hals-Nas.- u. Ohrenheilk., 1923, vi., 498.

The representation of each cochlea in both cortical centres is unquestionable and indispensable; for if, for instance, the left cortical centre were in connexion with the right ear only we would presumably find ourselves afflicted with word-deafness if this ear were stopped up, which is obviously absurd.

It is, therefore, quite natural that the loss of the right cerebral hemisphere should not involve deafness of either ear. The loss of the *left* hemisphere would no doubt (in a right-handed patient) entail "word-deafness," if only for a time, as in Mott's classical case. I am, Sir, yours faithfully,

London, July 2nd, 1928. JAMES DUNDAS-GRANT.

ACUTE APLASTIC ANÆMIA.

To the Editor of THE LANCET.

SIR,—In referring to the treatment, followed by recovery, of the case of this hitherto rapidly fatal disease recorded in my book, your reviewer (THE LANCET, June 23rd, p. 1285) states that "numerous therapeutic products of one sort and another" were used, and suggests that, therefore, it is impossible to assess the part played by injections of liver substance. This conveys the impression that the treatment was of the "blunderbuss" type. Over a period of 3½ months three treatments were used (if we exclude such medicaments as rhubarb and soda, calomel, and the mild measures directed against the intestinal infection, none of which can have had any effect on blood regeneration). These treatments were hemostyl, liver substance, and vaccines. The stock vaccines were given sporadically to combat complicating catarrhal infections. Diet can be excluded as a factor, since the child was on a dietetic régime supervised from birth and, if anything, the diet was less adequately supplied with vitamin A and fats during the illness than before it—a point dealt with by me in criticising Koessler's views regarding the importance of these substances in blood regeneration. We are left with hemostyl and liver substance as therapeutic measures, and the alternative possibility of spontaneous recovery. This last can be ruled out by the fact that no case of recovery from *acute* aplastic anæmia has been recorded. The two cases quoted from my book by your reviewer were of chronic aplastic anæmia and were introduced to support my argument regarding a liver hormone-organ controlling blood production. One of them could only be traced for 12 months after the reported recovery, and the other (Gibson's case) has not completely recovered, and was still under treatment with an abnormal blood count some months ago. My case is now running about and apparently normal, having had no liver treatment (except for one week in May) since February.

Treatment by hemostyl and by liver substance only overlapped for three days—i.e., from Nov. 5th to 8th. In spite of the reaction in the platelet system during hemostyl treatment, the other marrow-formed elements continued to descend, the polymorphs reaching one of the lowest counts recorded in the literature. After five days of liver treatment regeneration was observed. The total number of the polymorphs was taken as the index of efficacy of the treatment throughout, and their curve closely followed the dosage curve. The reticulocyte count to which others attach so much importance (following the lead of the Americans), was not used, mainly because its value is more qualitative than quantitative, and it cannot therefore be as serviceable a guide to dosage. Throughout the period of liver disturbance the total polymorph count shows a quantitative relationship to the amount of liver substance injected, and was a most valuable guide to dosage. Armed with the convictions tentatively put forward in my book, I have since treated a number of cases of varying degrees of depressed bone-marrow function with injections of liver substance; the results, which will be published later, are most gratifying.

Others have proclaimed the uselessness of liver therapy in aplastic anæmia. The recorded data upon which this misleading pronouncement is based are inadequate and unscientific. Masses of liver by the mouth, even concentrated extracts by the mouth, are a crude form of treatment compared to hypodermic medication. Successive blood counts, unless taken at the same time each day in a particular case, are not a true indication of progress, particularly in children. Counts done by different individuals on the same patient increase the margin of error due to the personal equation and cannot be compared with counts done by a single skilled pathologist; this especially applies to platelet counts. When one contemplates the helplessness of the physician confronted with this dreadful illness a life-saving measure, which at least has the merit of simplicity, is deserving of respect.

I am, Sir, yours faithfully,

Bradford, June 28th, 1928. A. HAYES SMITH.

ENCEPHALO-MYELITIS FOLLOWING VACCINATION.

To the Editor of THE LANCET.

SIR,—In a recent letter in your columns we reported six cases of acute meningo-encephalo-myelitis, with the statement that these cases "differed in many respects from acute epidemic encephalitis and showed a marked clinical similarity to post-vaccinal encephalitis." Prof. Ledingham, writing on June 16th, states that this "would imply that this latter affection possesses a more or less stereotyped symptomatology." We cannot agree that our letter contained such an implication, and we are as familiar as Prof. Ledingham with the variability of the clinical pictures. Our six cases present this variability in a striking manner. Thus we state that "cervical rigidity and Kernig's sign were present in four cases and trismus in one. . . . Aphasia was noted in two cases, quadriplegia in one, hemiparesis in one, and in one the principal signs were those of a myelitis." The variability of our cases, in fact, appeared to us to be a further point of resemblance between them and post-vaccinal encephalitis.

It is a matter of general experience that many diseases present an extremely variable clinical picture. This is notably the case with encephalitis lethargica and with disseminated sclerosis, but this fact does not debar us from regarding them as clinical entities and from speaking of resemblances and differences between them.

We are, Sir, yours faithfully,

DONALD HUNTER.
W. RUSSELL BRAIN.

London Hospital, Whitechapel, E.,
July 2nd, 1928.

GLASGOW HOSPITALS.—On Friday in last week the Prince of Wales attended one of seven performances of a Scottish historical pageant in the grounds of Garscube House, Glasgow, in aid of the building fund of the Incorporated Glasgow Dental Hospital. Many of the characters were impersonated by their descendants. The existing hospital premises have been condemned as "a derelict dwelling-house" and insanitary, with no possibility of making provision for dental research.—The annual report of the Glasgow Royal Hospital for Sick Children states that the number of in-patients has grown from 1089 in 1907 to 7143 in 1927, and the out-patients' attendances from 42,302 to 83,591. In 1907 the ordinary expenditure was £7861; last year it was £38,039. The first part of the programme of enlargement has now been completed, and the provision of better accommodation for the nurses and domestic staff has made two more wards available for patients. Progress will now be made with the new admission block, which will not only provide for a greatly increased number of out-patients but will provide space on the upper floors for nearly 100 patients. A lecturer on biochemistry in relation to infancy and childhood is about to be appointed in the University of Glasgow, and he will be biochemist to the hospital and work in its laboratory. It is also hoped shortly to establish a research lectureship on the pathology of the diseases of infancy and childhood. The endowment of £15,000 for this purpose is being provided by Mr. William G. Gardiner and Sir Frederick Gardiner.

Obituary.

EDGAR MARCH CROOKSHANK, M.B. LOND.,

EMERITUS PROFESSOR OF COMPARATIVE PATHOLOGY AND BACTERIOLOGY, KING'S COLLEGE, LONDON.

WE regret to announce the death of Dr. E. M. Crookshank, which occurred on Sunday last, July 1st, at his country house, Ridge Hill Manor, East Grinstead, in his seventieth year.

Edgar March Crookshank, the son and grandson of soldiers, from school age showed a bent towards natural science. He was educated at King's College School and, proceeding to the hospital, obtained the diploma of M.R.C.S. in 1881, graduating in medicine at the University of London three years later. His career as a student was distinguished, for he gained both exhibitions and scholarships at King's College, while he won the gold medal in anatomy in the examination for the London M.B. Lister arrived in London to take up his appointment at King's College Hospital at the time when Crookshank was completing his training. The Listerian doctrines were practised more rigidly at King's than at any hospital in the metropolis, and Crookshank, one of Lord Lister's dressers, acted as house surgeon to the institution. Owing to this fact, as much as to certain family influence, Crookshank was selected for special duty in the Egyptian Expedition of 1882: he was present at the battle of Tel-el-Kebir, and received the Khedival Star and other decorations.

Following on his experiences of antiseptic surgery in military campaigning, of which he wrote at the time a very sound account, Crookshank decided to make the study of bacteriology his professional career. He proceeded to Paris, where Pasteur, who had already made his famous studies on fermentation, was at work on the problems of rabies, and welcomed the pupil of Lister. Thence he went to Berlin, and studied under Koch, at that time Director of the Institute of Health, and engaged in perfecting his original discoveries in relation to tuberculosis. The result was the publication by Crookshank, in 1886, of a "Manual of Bacteriology" which met with a good reception on its appearance, and secured for its writer the professorship of bacteriology at King's College. Here he founded the laboratory for human and veterinary pathology and did much educational work in connexion with these subjects. He wrote largely and taught energetically, and showed considerable independence of attitude. For example, with regard to vaccination, he followed the lines laid down by that great historian of epidemiology, Charles Creighton, but he attempted also to find grounds of his own for dissent from much accepted teaching. In many places his criticisms of popular conceptions were no doubt sound, and this would to-day be admitted, but he was not able to make converts through his own reasoning to the views which he proposed to substitute. He retired from active work at King's while still a young man, and it is over 30 years since the fourth and last edition of his text-book of bacteriology appeared. But by that time the work was no longer up to date, in spite of reconstruction, revision, and enlargement. In its day, however, it was a valuable contribution to the literature of what was still a new subject; it was inclusive—ambitiously so; it was well illustrated, both by original illustrations and by loans from the best sources; it was furnished with appendices, in which practical instructions were given as to the fitting-up of the laboratory; and it had a bibliography through which readers could obtain a real introduction to French and German literature.

On his resignation of his post as active professor in 1889, he was given Emeritus rank and elected a Fellow of King's College; but he carried into retirement a keen interest in medical and especially veterinary problems, while his interest in local administration was widely manifested. In 1891 he was appointed J.P. for Sussex, and became at once an active member of the Bench, taking a prominent part in the public life of the district, while he stood for the East Grinstead Parliamentary Division of the County as a Unionist. He took, further, advantage of all opportunities for travel always combining his sporting proclivities—and he was an accomplished hunter of big game—with careful investigations into the various social problems of the places which he visited, and these included South Africa, Australia, Canada, and the West Indies. Thus he familiarised himself with the productive powers of most of the countries under our Colonial administration. All these experiences confirmed him in his deep interest in veterinary surgery, manifested early in the circumstances of the founding of the bacteriological laboratory at King's College. He was for nearly 40 years one of the governors of the Royal Veterinary College, and presided at different times over the committee of management of the Research Institute and of the General Purposes Committee, and took a prominent part in the appeal for rebuilding the present College in Camden Town.

Prof. Crookshank married, in 1885, Harriet, only daughter of Thomas Colfax, J.P., of Bridport, by whom he had two sons and three daughters.

HENRY HANDFORD, M.D. EDIN., F.R.C.P. LOND., D.P.H.

Dr. Henry Handford, who died on June 24th at the age of 73, long played an important part in the public life of Nottingham and its county, first as clinician and later as administrator. A son of Dr. Thomas Handford, who practised at Atherstone, in Warwickshire, he was educated at the University of Edinburgh, where he proved a brilliant student, winning University medals in physiology, pathology, medicine, clinical surgery, midwifery, and other subjects. After graduating as M.B., C.M. with honours in 1878, he took up an appointment as medical tutor at Queen's College, Birmingham. It was not long, however, before he decided to settle in Nottingham, and as physician to the General Infirmary he soon won a high reputation for wide learning. Though he read extensively, his knowledge was chiefly his own, acquired by diligent observation and exact examination of his patients. The signs and symptoms which they presented were always interpreted as far as possible in the light of the most recent pathological knowledge available, and Handford was himself a careful student of pathology. As an illustration of his methodical research we may recall a demonstration before the Nottingham Medical Society in 1884, when he showed numerous pure cultures of pathogenic organisms, and in the following year when he showed microscopical preparations of *Bilharzia hæmatobia* and sections from cases of choreic insanity, myelitis, actinomycosis and supposed malignant pustule. This list is evidence of the wide range of his interests, and their catholicity is further shown by the titles of papers read before the Pathological and Clinical Societies of London, of which he was a keen member. In 1904 he described a case of heart-block and demonstrated the causative lesion, a gumma in the bundle of His; and many papers in medical journals bore witness to his special interest in cardiology. In 1899 the value of his contributions was recognised by his election as a Fellow of the Royal College of Physicians of London, of which he had become a Member in 1885. Seven years later he resigned his post of honorary physician to the General Hospital on being appointed medical officer of health for the county. In this new work he displayed the same thoroughness, conscientiousness, and courtesy to those with whom he worked, but his friends could not but regret the loss to clinical medicine in the city. During his 26 years of office he found much to do for the welfare of the county, and also served a term of office as president of the Midland Branch of the Society of Medical Officers of

Health. "Those who knew him well," writes a colleague, "admired him equally for his excellence as physician and for his qualities as a man. No one could be more kind and courteous than he was at all times and under all circumstances: there was about him a sort of refined dignity of bearing which compelled respect. A love of literature and music and a great hatred of any approach toward untruthfulness completed the picture of the truly cultured gentleman."

Dr. Handford married a daughter of the first Lord Belper, and she survives him. His two sons were killed on Jan. 1st, 1916, at the Hohenzollern Redoubt.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

DUTY ON SCIENTIFIC FILMS.

On Tuesday, July 3rd, the House of Commons went into Committee on the Finance Bill, Mr. J. F. **HOPE**, Chairman of Committees, in the chair.

Captain **FRASER** moved a new clause to exempt from duty films recording scientific investigations or research which are imported into Great Britain or Northern Ireland when the Commons were satisfied that the films would not be sold or hired or publicly exhibited for profit. He said that the man who had carried out researches with a microscope, or in other directions of a scientific, and particularly of a medical-scientific kind, now found it possible, through the technique which had been developed, to record those researches and investigations upon a film instead of upon paper. The free interchange of the results of these investigations was something which no taxation should be allowed to impede.

Dr. **DRUMMOND SHIELS** seconded the new clause. He said that, even in the few years since 1925, the importance of these scientific films had considerably increased. Many of them had originated in America, Germany, and other countries, and they had proved most valuable for teaching and scientific purposes. There ought to be free trade in all that appertained to science and research. The only possible objection he could see was that of administration, but it should be possible for the scientific bodies to which such films would be consigned to give a certificate which would make it possible to work this exemption without causing much administrative difficulty. He hoped that the Chancellor of the Exchequer would receive the proposal in a sympathetic spirit.

Mr. A. M. **SAMUEL** (*Financial Secretary to the Treasury*) said that this clause had received the most careful consideration, with a desire, if possible, to give effect to it. It had been found, however, that, in these days of popular science, it would be impossible for the Revenue authorities to distinguish the scientific films from those which could be shown in the ordinary way, and to be sure that the former were not subsequently shown in picture-houses.

Captain **FRASER** assured the Chancellor of the Exchequer that the films to which the clause referred were only of scientific interest and were in no sense of the word "popular."

Mr. **CHURCHILL** said that while he could give no undertaking in the matter, he would see that the facts were examined again. Those responsible for making that inquiry would receive any further evidence that Captain Fraser might bring forward.

The proposed clause was then withdrawn.

HOUSE OF LORDS.

THURSDAY, JUNE 28TH.

Dogs Act (Amendment) Bill.

The Earl of **CRANBROOK** moved the second reading of the Dogs Act (Amendment) Bill which has passed through the Commons. The measure, he explained, extended the liability of the owner of a dog which did injury to poultry. The Bill also dealt with the delivery of stray dogs to the police.

Viscount **BERTIE** of **THAME** pointed out that whereas under the principal Act no dogs could be sold for vivisection, found dogs under this Bill were not so protected. In Committee he would move an amendment to bring the Bill into line with the present law in that respect.

The Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 27th.

Small-pox in England and Wales.

Mr. **SHEPHERD** asked the Minister of Health the number of cases of small-pox reported for England and Wales for the latest week available; and the number of cases discovered amongst casuals during any convenient period.—Mr. **CHAMBERLAIN** replied: The provisional number of notifications of cases of small-pox in England and Wales for the week ended June 23rd last was 230. I have no precise information as regards the latter part of the question, but during the period Jan. 24th to June 25th, 1928, 124 cases of small-pox have been reported among casuals.

Health Insurance Benefits and Outdoor Relief.

Mr. **LANSBURY** asked the Minister of Health what instructions, if any, he had issued to his inspectors and to public auditors in connexion with poor-law relief to persons in receipt of national health insurance benefit; and whether he was aware that his officers and certain auditors were forcing boards of guardians to take into account health insurance benefits when assessing outdoor relief, despite the fact that the Insurance Acts expressly provided that boards of guardians should not take health insurance payments into account when assessing the need of applicants for poor-law assistance.—Sir **KINGSLEY WOOD** replied: My right hon. friend has given no instructions of the kind suggested in the first part of the question. The answer to the second part is in the negative. I would, however, remind the hon. Member that boards of guardians are only precluded from taking into account health insurance benefits up to 7s. 6*d*. a week.

Inspector of Medical Supplies.

Mr. **JOHN PALIN** asked the Secretary of State for War whether the inspector of medical supplies employed at the War Office was a qualified pharmacist; and whether it was part of the duties of the inspector of medical supplies employed at the War Office to pay periodical visits to the medical store depôts for the purpose of inspecting medical supplies and of ascertaining whether due care was being exercised in respect of the storage of such medical supplies.—Sir L. **WORTHINGTON-EVANS** replied: The inspector is qualified; there is only one Army medical store depôt; it is not part of his duty to inspect it.

Mr. **PALIN** also asked the Secretary of State for War whether the advice of the inspector of medical supplies had been taken as to what medicinal preparations used by the Army could be conveniently and economically prepared in the dispensing laboratories of Army hospitals.—Sir L. **WORTHINGTON-EVANS** replied: Yes, sir.

Silicosis and Workmen's Compensation.

Mr. **WILLIAM HIRST** asked the Home Secretary the total number of claims at the latest available date under the Workmen's Compensation Act, in connexion with the silicosis scheme, by July, 1927, and the number as affecting Birmingham and Sheffield respectively.—Sir **WILLIAM JOYNSON-HICKS** replied: I presume the hon. Member refers to the scheme for the metal grinding industries which came into operation on July 1st last year. I regret that I am unable at present to give any figures, but information as to the number of cases in which compensation was paid under this scheme during the six months, July to December, 1927, is being collected and will be available later.

THURSDAY, JUNE 28TH.

Allowances to Mentally Deficient Orphans.

Sir **RICHARD LUCE** asked the Minister of Pensions if he would consider the possibility of extending benefit under the Pensions Act to the orphan children of pensioners who were mentally or physically deficient after they reached the age of 21.—Major **TRYON** replied: I have no authority under the Royal Warrants to continue allowances, which normally cease at the age of 16, beyond the age of 21. I have, however, taken, and am taking, measures within my powers, and without encroaching on the obligations of local education and health authorities in the matter, to coöperate with other agencies in securing such suitable treatment or training of the children before they reach the age of 21 as will enable them as far as possible to contribute to their own support.

Medical Inspection of Casuals.

Mr. **SHEPHERD** asked the Minister of Health when the order for the medical inspection of casuals expired and whether it was his intention to extend it.—Mr. **CHAMBERLAIN** replied: I am extending the present direction on this subject, which expires at the end of this month, to the end of September next.

Welsh Board of Health.

Mr. John Williams asked the Minister of Health whether he could make any statement to the House on the future constitution of the Welsh Board of Health; whether it was proposed permanently to reduce that body to three; and what the number of the body was when originally set up.—Mr. Chamberlain replied: The Welsh Board of Health consisted of three members when it was originally constituted. At a later date the administrative officer for public health became an ex-officio member of the board. With regard to the first and second parts of the question, I would refer the hon. Member to the answer given on June 25th.

Mr. John asked the Minister of Health who was the present Member for Wales on the National Health Insurance Joint Committee; who would be the member in future; and whether Mr. John Rowland, a member of the Welsh Board of Health, was to act as deputy for him.—Mr. Chamberlain replied: The present member of the National Health Insurance Joint Committee appointed by me under Section 88 of the National Health Insurance Act, 1924, as "a person having special knowledge and experience of National Health insurance in Wales," is the hon. Member for Monmouth, and I do not propose to make any change. I have appointed Mr. John Rowland to succeed Sir Thomas Hughes as deputy to the hon. Member for Monmouth at meetings of the Committee at which the hon. Member is unable to be present.

Captain Arthur Evans asked the Minister of Health if he would consider the advisability of appointing one of the present reduced Welsh Board of Health a member of the joint consultative committee of the United Kingdom, instead of appointing a deputy for a representative whose official connexion with the Welsh Board of Health has now terminated.—Mr. Chamberlain replied: My hon. friend appears to be under some misapprehension. The hon. Member for Monmouth, who is and has for some years been the Welsh representative on the National Health Insurance Joint Committee, is not in any way officially connected with the Welsh Board of Health. The retiring chairman of the Welsh Board of Health was appointed to act as deputy to the hon. Member for Monmouth at meetings of the Committee at which the hon. Member was unable to attend, and I have now appointed a member of the Welsh Board of Health to act in the same capacity.

Captain Evans also asked the Minister of Health, seeing that the actual saving effected by not appointing one of the present reduced Welsh Board of Health as chairman was approximately £300 per annum, and that the status and influence of such an important board must be detrimentally affected by the exclusion of a chairman, whether he would appoint one of their present number chairman.—Mr. Chamberlain replied: The status and functions of the Welsh Board of Health are not, in my view, affected by the decision not to appoint a chairman. The bulk of the work of the board is satisfactorily done by the members of the board in their individual capacity, and meetings of the board are but rarely held. The answer to the last part of the question is in the negative.

Unclaimed Bodies for Anatomical Examination.

Mr. Kelly asked the Minister of Health the reason for the request made by his department that unclaimed bodies of deceased patients in the Park Prewet and Brookwood Asylums, and other mental institutions under the Farnham Union, should be handed over to the University of Oxford for anatomical examination.—Mr. Chamberlain replied: The request to which the hon. Member refers has been made to these and other similar institutions in order to assist in the provision, under proper safeguards, of unclaimed bodies for anatomical examination, which is indispensable to medical education.

MONDAY, JULY 2ND.

Biochemical Research.

Miss Wilkinson asked the President of the Board of Trade what aid, financial or otherwise, the Government was giving to promote research into the practical application to industry of the science of biochemistry.—Mr. H. G. Williams (Parliamentary Secretary to the Board of Trade) replied: A considerable amount of biochemical research is conducted by the Department of Scientific and Industrial Research, particularly in relation to its investigations on the preservation and transport of foodstuffs. The Department also makes grants to a number of coöperative research associations, organised by various industries to investigate their own special problems, whose work is partly of a biochemical nature. As this work is closely linked up with other work not directly biochemical in nature, it is impossible to estimate its cost separately.

Refuse Burning in Louth and Public Health.

Lieut.-Colonel Heneage asked the Minister of Health if he had received a resolution signed by inhabitants of Louth calling attention to the burning refuse pit in the town, which was so situated that odours and smoke were causing danger to health and annoyance to inhabitants; and what reply he had returned.—Sir Kingsley Wood replied: My right hon. friend has received a petition in reference to this matter, and is communicating with the town council.

The Rating of Voluntary Hospitals.

Captain Cazalet asked the Minister of Health whether he was aware of the inconsistencies prevalent to-day throughout the country in regard to the rating of voluntary hospitals; that in Devon the rating assessment committees had resolved that voluntary hospitals in that county should be rated at 7*s.* 6*d.* per bed, including nurses' beds, while in Wiltshire the rating and assessment committees had adopted the basis of £5 per head additional to nurses' beds; and whether he could give to the House the assurance that such inequalities would be removed under the new Valuation and Rating Act.—Sir Kingsley Wood replied: The Central Valuation Committee has reported the existence of considerable diversity of practice in the assessment of voluntary hospitals. My right hon. friend has circulated the Committee's recommendations on this matter to the local authorities concerned, but he is not empowered to interfere with their discretion in the assessment of any class of hereditament. I may add that the matter is not germane to the Government's proposals for giving relief from rating burdens to agriculture and industry.

Spitting in Public Places.

Major Colfox asked the Minister of Health whether he would, in the interests of public health, introduce legislation to prohibit the practice of spitting in public places.—Sir W. Joynson-Hicks replied: No fresh legislation is required. The matter is one which can be dealt with by the local authorities by means of good rule by-laws under the Municipal Corporations Act and Local Government Act. By-laws on the subject are in force in a number of places.

Destruction of Lost or Strayed Dogs.

Sir Robert Gower asked the Home Secretary whether his inspectors' reports showed that adequate accommodation existed at all police stations for the reception of lost and strayed dogs; and what methods were adopted by the police for the humane destruction of lost or strayed dogs which were not claimed by their owners.—Sir W. Joynson-Hicks replied: I have no information as to the arrangements outside London, but in the Metropolitan Police District the accommodation is adequate, and it is a condition required of the contractors that the dogs handed over to them which are not claimed should be destroyed in such manner as to cause as little pain as possible.

TUESDAY, JULY 3RD.

Medical Services in Scotland.

Sir Archibald Sinclair asked the Secretary of State for Scotland whether his attention had been drawn to the statement in the Report of the Scottish Board of Health that the gap was widening between the standard of medical services in the Highlands and that in the Lowlands; and what provision was being made for the maintenance and improvement of the Highlands and Islands medical service during the current year.—Sir J. Gilmour replied: The statement referred to expresses the view of the Consultative Council on Highlands and Islands, whose report I have seen and am now considering. As regards the second part of the question, the money available in the Highlands and Islands (Medical Service) Fund is sufficient to maintain the medical services on their present scale during the current year. It is anticipated, however, that the fund will be exhausted by the middle of next financial year, before which time the question of what further financial provision should be made will be fully considered in the light of the whole circumstances of the case.

Sir A. Sinclair asked if provision would be made in the meantime for catching up the leeway as well as for maintaining these services at the lower level to which they had fallen.

Sir J. Gilmour said that the provision for this year had been made and would be carried out to the full.

THE ASTHMA RESEARCH COUNCIL.—A part-time research scholarship is being founded to investigate the various physical treatments of asthma. The selected candidate will be required to visit Mont Dore and other continental resorts for the treatment of asthma prior to taking up the work in London, and preference will be given to one who already holds a professional post. An advertisement in this issue of THE LANCET sets out the conditions of the appointment. Dr. E. A. Cockayne and Colonel F. E. Fremantle, M.P., have joined the Medical Advisory Committee of the Council.

Medical News.

UNIVERSITY OF OXFORD.—At a Congregation held on June 28th the following degrees were conferred:—

D.M.—A. A. F. Peel and F. E. Fremantle.
B.M.—F. G. Parker.

Dr. John Farquhar Fulton has been elected to a research fellowship in natural science at Magdalen College. Dr. Fulton came to Magdalen as a Rhodes Scholar in 1921. He obtained a first class in the final honour school of physiology in 1923, and subsequently the degree of D.Phil. by research. He returned to Harvard, and since completing his courses for the D.M. degree of that University has been working in Dr. Harvey Cushing's clinic. He proposes to carry on research in physiology and to write on the history of physiology and the bibliography of the works of Robert Boyle.

UNIVERSITY OF BIRMINGHAM.—At recent examinations the following candidates were successful:—

M.D.

J. F. Brailsford and F. W. M. Lamb.

FINAL EXAMINATION FOR M.B., CH.B.

Second-class Honours.—G. H. Knight,* and A. B. Taylor.†
* Distinction in Medicine and Surgery.
† *Distinction in Medicine and Midwifery.*

Pass.—Mohamed Badr-El-Din, Charles Davies, I. K. Donovan, R. E. Johnson, C. E. Perry, F. R. Roberts,‡ M. C. Rosser, M. D. Sandoz, J. G. Stooke, and Nubar Yacoubian.
‡ *Distinction in Midwifery and Diseases of Women.*

FINAL EXAMINATION FOR B.D.S.

Class I.—A. T. Wynne.

FINAL EXAMINATION FOR DIPLOMA IN DENTAL SURGERY.

F. W. Hanlan, W. F. Hinds, and E. E. Newitt.

UNIVERSITY OF DURHAM.—At Convocations on June 26th and 27th the following degrees, diplomas, and licences were conferred:—

M.D.—Katherine M. Cellan-Jones, Margaret B. Herbst, I. M. McLachlan, T. H. Meek, P. J. O'Connell, L. G. Pearson, C. E. Reindorf, L. F. Richmond, T. W. Shaw, F. E. Stabler, and M. M. Suzman.
M.D. (for Practitioners of 15 Years' Standing).—Harold Balme.
M.S.—W. P. T. Watts.
M.B., B.S.—H. M. Brown, D. S. Buchanan, W. C. E. Diamond, M. A. Gaffar, Coley Goldstein, J. C. V. Hindhaugh, C. F. Ind, S. W. Smith, J. M. Tait, and H. G. Ungley.
B.S.—Ibrahim Girgis and L. G. Pearson.
B.Hy. and D.P.H.—T. L. J. Coxon, E. F. D. Dawson-Walker, and J. W. Hunter.
L.D.S.—Margaret I. Lamb, R. R. Maclean, C. E. Shafto, and G. S. Yeoman.

UNIVERSITY OF SHEFFIELD.—At recent examinations the following candidates were successful:—

M.B., Ch.B.—K. J. G. Milne,* G. B. Thomas,* W. Alcock, R. D. Dewar, T. E. Gumpert, T. K. Owen, W. A. Timperley, and Joan J. J. Wallace.
* With second-class honours.

UNIVERSITY OF GLASGOW.—At a graduation ceremony on June 29th the following degrees were conferred:—

M.D.—*Mary P. McCunn, Robert Armstrong, and David Henderson.
* With commendation.

The History of Medicine Prize was awarded to Dr. William James Rutherfurd for an essay entitled A Cock to Æsculapius.

UNIVERSITY OF ST. ANDREWS.—At a graduation ceremony on June 28th the honorary degree of LL.D. was conferred, among others, upon Dr. E. P. Cathcart, Gardiner Professor of Physiological Chemistry in the University of Glasgow; and Dr. William Darrach, Professor of Surgery in Columbia University, New York.

UNIVERSITY OF DUBLIN.—At a meeting of the Senate on June 30th the honorary degree of Master of Surgery was conferred on Sir John Bland-Sutton; the honorary degree of Doctor of Science on Dr. George Linius Streeter, director of the Department of Embryology in the Carnegie Institute, Baltimore, U.S.A.; and the honorary degree of Master of Arts on Miss Margaret Huxley, an Overseer of Trained Nurses in Ireland. Of Sir John Bland-Sutton, the Public Orator, Sir Robert Tate, spoke as famous alike as operative surgeon, teacher, scientific investigator, and learned archæologist. Miss Huxley, generally regarded as the leading representative of nursing in Ireland, the Public Orator described as "feminam strenuam, certam, optimam" in reference to her magnificent work as matron of Sir Patrick Dun's Hospital. In the evening Miss Huxley was entertained at dinner by a large company of hospital matrons.

HUNTERIAN SOCIETY.—Dr. Arthur Westerman has been elected president of this Society for the coming year. The honorary secretaries are Mr. W. E. Tanner and Dr. D. C. Norris.

EPSOM COLLEGE: ANNUAL GENERAL MEETING OF GOVERNORS.—Dr. Raymond Crawfurd presided at the seventy-fifth annual general meeting of the Governors of Epsom College on Friday, June 29th, 1928, at the office, 49, Bedford-square, W.C., when there was a good attendance. The following is a list of the successful candidates for pension and foundation scholarships at the elections, together with the number of votes gained in each case. Dr. Raymond Crawfurd, Dr. J. Walter Carr, and Dr. Seymour Taylor were the scrutineers. Hadlow Pensioners: Dr. James S. Robertson, 4157; Mrs. Gertrude Middlemist, 3326; Mrs. Elizabeth Christian, 2485; and Mrs. Mary G. S. Kenny, 2086. Ordinary Pensioners: Mrs. Ellen M. Blake, 2057; Dr. Lambert Houghton, 2012; Mrs. Ida M. S. Style, 1672; and Dr. Vincent O. Taylor, 1634. Pugh Pensioner: Mrs. Mary K. Ingledew, 1481. *Brodie Sewell Annuities*: Miss Ella M. Leney, 2631; and Miss Elizabeth E. B. D'Olier, 1793. *Foundation Scholars*: Alfred G. Stansfeld, 17,657; Geoffrey G. Wallis, 13,079; John R. Copeland, 11,042; John A. K. Holburn, 10,757; John Watson, 10,496; Antony L. Haynes, 10,427; Louis C. Dillon, 8051; and Eric J. Holborow, 6531.

Dr. F. W. Collinson and Dr. R. W. Innes Smith were elected vice-presidents of the College in recognition of their valued services, each having collected a sum of over £1000 as honorary local secretary.

In proposing the adoption of the report for the past year, the Chairman referred to the progress of the fund opened for the provision of a new sanatorium, outline plans for which, together with full particulars as to the accommodation, were given in THE LANCET of Dec. 3rd last. Dr. Crawfurd pointed out that if two sums of £5000 were to be received, the Council would be in a position to put the work in hand, as the total collected to date amounted to close upon £5000. The College would benefit in another direction by the provision of this building, as the old sanatorium could be easily adapted for the admission of about 40 more boarders, and the enlargement of the school in this way would result in many economies. Furthermore, the increased income would enable the Council to improve the salaries paid to the masters.

BRITISH PATHOLOGISTS ASSOCIATION.—The second summer meeting of this association was held in the Pathological Department of the Royal Infirmary, Chester, on Saturday, June 30th, Dr. W. H. Grace, pathologist to the hospital, being in the chair. The meeting was devoted to the discussion of the methods used in the examination of the blood. Procedures were described and demonstrated as follows: by Dr. J. G. Greenfield, the making and staining of blood-films, the differential count of the white cells, the counting of the red and white cells, the estimation of hæmoglobin by the Hellige method, and the reticulocyte count; by Dr. A. Renshaw, the examination of the blood for parasites and the presence of organisms; by Dr. S. C. Dyke, the platelet count, the grouping and matching of bloods, and the estimation in the blood of cholesterol, bilirubin, and inorganic phosphates; by Dr. Grace, the estimation of the blood-sugar by the Folin-Wu method; by Dr. A. G. Shera, the estimation of the blood-sugar by MacLean's method and of the blood-urea by Kennaway's method; by Dr. A. F. S. Sladden, the estimation of the blood-urea by a modification of MacLean's method; and by Dr. W. E. Carnegie Dickson, the estimation of the serum calcium. The members of the staff of the Chester Royal Infirmary entertained the members of the association at dinner in the evening.

LONDON HOSPITAL PRIZE-GIVING.—The distribution of prizes on June 29th opened with a report on the Medical College by the Dean, Prof. William Wright. After referring to the knighthoods recently conferred on two old London Hospital men, Dr. J. A. Hosker, of Bournemouth, and Mr. H. S. Newland, of Adelaide, he mentioned that Sir Henry Head had been awarded the Moxon Medal of the Royal Society, and that Prof. Major Greenwood had been elected F.R.S. The hospital had lost, by resignation, the services of Dr. Lewis Smith and Sir Hugh Rigby, whose professional lives had been uninterruptedly linked with it. The vacancies thus left in the hospital staff had been filled by Dr. Russell Brain and Mr. Hugh Cairns, whilst Mr. G. V. Stephenson had been appointed demonstrator of anatomy in the College. Prof. Wright then spoke of the deaths which had occurred during the year, including those of Dr. C. W. Daniels, Mr. A. D. Dinnis, Dr. Nelson Younger, Mr. L. R. Fifield, and Dr. A. Lister. Another loss was sustained by the death of Mr. W. Douro Hoare, chairman of the College Board from 1898 to 1921, to whom the College owed much. A lectureship in ophthalmology, said Prof. Wright in conclusion, had been established with a legacy of £1000 from Mr. Warren Tay.

The Chairman, Lieut.-Colonel W. M. Pryor, then introduced Sir Samuel Hoare, Secretary of State for Air, who came, he said, as the head of a family which had been intimately associated with the hospital and College for many years.—Sir Samuel presented the prizes and honorary certificates of merit awarded to students of the Medical College and Dental School. As the world grew more complicated, he said, it was more and more difficult for men in one profession to keep in touch with men in another. He came, therefore, to learn something about the London Hospital and to tell something about the development of aviation, and he was glad to think that there was already a link between the two in the person of Group-Captain Martin Flack, one of his senior medical advisers. The tests of fitness for flying had been developed by practice rather than theory. The investigators had started by taking their hundred best pilots and analysing their qualities. He wondered whether this method could be applied in the medical profession or in politics. In the profession of collecting money it would be unnecessary to look out for 100 beggars; they could simply analyse the qualities of Lord Knutsford. The medical profession, continued Sir Samuel, was trying to raise the standard of the world's health. He was engaged in attempts to improve its communications. These were the two first needs of the world to-day, especially in the less-developed parts of the British Empire. In recent military operations in the Kurdistan mountains there was a very serious outbreak of dysentery among the troops, but it proved possible, with aeroplanes, to remove the 200 sick to Bagdad, so that they all recovered.

A vote of thanks to Sir Samuel Hoare was proposed by Lord Knutsford, and seconded by Dr. Robert Hutchison.

CARLISLE FEVER HOSPITAL.—As the result of the recent inquiry, described in THE LANCET of June 16th (p. 1239), the Charity Commissioners have agreed to the transference of the Carlisle Fever Hospital to the corporation of the city. The claim of the city council to the control of the hospital was based upon the fact that, in conjunction with the rural district council, it had for many years past chiefly maintained the institution. The claim was opposed by the governing body of the Cumberland Infirmary, which is only 150 yards from the fever hospital, on the grounds that, in the event of further extension becoming necessary, the site of the fever hospital would provide the means of enlargement and that an institution for the treatment of cases of infectious disease is in its wrong place amid a considerable population.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, July 9th to [illegible] 14th.—ST. JOHN'S HOSPITAL, [illegible] road, W. S[illegible] 262, Uxbridge- [illegible] ALL SAINTS [illegible] .30 P.M. on Tues.—Special [illegible] Bridge-road, S.W. W[illegible] 30 P.M. on Wed.—ROYAL W[illegible] HOSPITAL, Broad-street. ab[illegible] at 3 P.M. on Thurs. The [illegible] HOSPITAL, City-road, E.C.—One week's special course in proctology. Operations, demonstrations, and lectures.—PRINCE OF WALES'S HOSPITAL, Tottenham, N. Two weeks' special course in medicine, surgery, and the allied specialties. Further particulars from the Secretary.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham.

MONDAY, July 9th.—2.30 to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham.

THURSDAY, July 12th.—4 P.M., Dr. Hector C. Cameron: Demonstration of Children's Ailments.

Appointments.

BRICKWELL, F., M.B. Lond., M.R.C.S., has been appointed Medical Officer, Slough and Stoke Poges Districts.

CONNAN, D. M., M.B., B.S. Lond., D.P.H., Medical Officer of Health for Bermondsey.

Manchester Royal Infirmary: TAYLOR, B. A., L.R.C.P. Lond., M.R.C.S., House Surgeon to the Special Departments; NUGENT, Miss E. A., L.R.C.P. Lond., M.R.C.S., Junior Assistant House Surgeon (Central Branch); SOMERFORD, A. R., M.B., Ch.B. Manch., Assistant Medical Officer, Out-Patient Department; STOKOE, Miss L., M.B., Ch.B. Manch., Clinical Assistant, Medical Out-Patient Department; ANDERSON, Miss J., L.R.C.P. Lond., M.R.C.S., Clinical Assistant, Surgical Out-Patient Department; PEACH, Mrs. E. M., M.D. Manch., Assistant Medical Officer, Dermatological Department; SCOTSON, F. H., F.R.C.S. Eng., reappointed Resident Surgical Officer; GRAY, E. D., M.A., M.B., Ch.B. Aberd., reappointed Junior Assistant Medical Officer, Radiological Department; SMIRK, F. H., M.D. Manch., reappointed Medical Registrar; LAMBERT, V. F., F.R.C.S. Edin., Assistant Surgical Officer, Aural Department.

Queen Charlotte's Maternity Hospital: LOWRY, H. C., M.B., B.Ch., B.A.O. Belf., F.R.C.S. Edin., Senior Resident Medical Officer; and HEGGS, G. B. M., M.R.C.S., L.R.C.P. Lond., Assistant Resident Medical Officer.

Salford Royal Hospital: APPLETON, F., M.B., Ch.B. Manch., House Surgeon attached to the Orthopædic Department; BOLAND, C. R., M.B., Ch.B., B.A.O., attached to the Genito-Urinary Department; and COCHRANE, H. L., M.B., Ch.B., attached to the Special Departments.

Certifying Surgeons under the Factory and Workshop Acts: JORDAN, G. R. L., M.B., B.Ch. Dub. (Halstead, Essex); and WILLIAMS, J. W., L.R.C.P. Lond., M.R.C.S., L.M.S.S.A. (Penarth, Glam.).

Vacancies.

For further information refer to the advertisement columns.

Association of Surgeons of Gt. Britain and Ireland, 17, Wimpole-street, W.—Surgical Scholarship. £350.

Asthma Research Council, London Clinic, Ranelagh-road, S.W.—Half-time Research Scholar. £300.

Barnsley, Beckett Hospital and Dispensary.—H.P. £140.

Bath, Royal United Hospital.—Asst. H.S. £100.

Birkenhead General Hospital.—Cas. H.S. £100.

Birmingham, Queen's Hospital.—Med. Reg. Also 3 Res. Surg. Officers. £200 and £100 respectively.

Brighton, Royal Sussex County Hospital.—Hon. Dermatological Clinical Asst.

Bury Infirmary.—Third H.S. At rate of £150.

Cambridge, Addenbrooke's Hospital.—Resident Anæs. At the rate of £180.

Central London Ophthalmic Hospital, Judd-street, St. Pancras. W.C.—Jun. H.S. £50. Also Pathologist. £75.

Chichester, Graylingwell Mental Hospital.—Third Asst. M.O. £350.

Coventry, Coventry and Warwickshire Hospital.—Res. H.P. £125.

Eastcote, Middlesex, St. Vincent's Orthopædic Hospital.—Res. M.O. At rate of £150.

East London Hospital for Children, &c., Shadwell, E.—Res. M.O. £200.

Exeter, Royal Devon and Exeter Hospital.—Hon. Asst. P.

Exminster, Devon Mental Hospital.—Jun. Asst. M.O. £300.

Gordon Hospital for Rectal Diseases, Vauxhall Bridge-road, S.W.—Res. H.S. £75.

Harefield, Middx., County Tuberculosis Sanatorium.—Sen. Asst. Res. M.O. £450.

Herefordshire General Hospital.—H.P. At rate of £100.

Hospital for Consumption and Diseases of Chest, Brompton.—H.P. £50.

Kimberley Hospital, South Africa.—Radiologist-Jun. H.S. £750.

Lahore, Mayo Hospital.—Anæsthetist, Rs.500/-25-1000/- per mensem.

Leeds City Hospitals.—Med. Supt. £850.

Leeds Public Dispensary.—Sen. Res. M.O. £200. Also Hon. P.

London Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150.

London Jewish Hospital, Stepney Green, E.—Hon. Radiologist.

Maidstone, Kent County Ophthalmic and Aural Hospital.—Aural H.S. At rate of £200.

Manchester, St. Mary's Hospitals.—4 H.S.'s. Each at rate of £50.

Manchester, Salford Royal Hospital.—H.P. At rate of £125.

Marseilles, Queen Alexandra Memorial Hospital.—Res. M.O. At rate of £150.

Mental Hospital, Berrywood.—Locum tenens M.O. £7 7s. pe week.

Miller General Hospital for South-East London, Greenwich-road, S.E.—H.S. £125.

National Hospital, Queen-square, W.C.—Hon. Surg. Asst.

Newark Hospital and Dispensary.—Res. H.S. At rate of £150.

Nottingham, City Mental Hospital.—Jun. Asst. M.O. £350.

Nottingham General Hospital.—Res. Cas. O. At rate of £200.

Nottinghamshire County Council and Mansfield Woodhouse Urban District Council.—Joint M.O. £700.

Portsmouth, Royal Portsmouth Hospital.—Sen. H.S., also Cas. O. At rate of £200 and £100 respectively.

Rochdale Infirmary and Dispensary.—Jun. H.S. £200.

Royal Army Medical Corps.—Commissions.

Royal College of Surgeons of England.—Election to Court of Examiner, also Election of Examiner in Dental Surgery.

Royal Manchester Children's Hospital, Pendlebury, nr. Manchester. Res. M.O. At rate of £125.

Ryde, Royal Isle of Wight County Hospital.—Res. H.S. £130.

St. Leonards-on-Sea, Buchanan Hospital.—H.S. £150.

St. Mark's Hospital for Cancer, &c., City-road, E.C.—Res. Surg. O. At rate of £150.

St. Mary's Hospital Institute of Pathology and Research, Paddington, W.—Research Studentship. At rate of £200.

St. Mary's Hospital, W.—Dental Surgeon.

St. Pancras School for Mothers, Ampthill-square, N.W.—M.O. 1½ gns. per consultation.

Sheffield, Crimicar Lane Sanatorium.—Asst. Tuberculosis Officer. £450.

Stoke-on-Trent, Longton Hospital.—H.S. £120.

Taunton, Taunton and Somerset Hospital.—Sen. and Jun. House M.O.'s. At rate of £150 and £100 respectively.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. and H.S. Both at rate of £100.

Wallasey, Victoria Central Hospital.—Jun. H.S. At rate of £100.

West Kent Joint Hospital Board (Infectious Hospitals).—R.M.O. £400 per annum.

West London Hospital, Hammersmith-road, W.—Res. Asst. Surg. £200.

Westminster Hospital Medical School, S.W.—Hon. Lecturer on Tropical Diseases.

Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £100.

Births, Marriages, and Deaths.

BIRTHS.

BISHOP.—On June 28th, at Perryn-road, Acton, W., the wife of Dr. P. F. Bishop, of a son.

CADE.—On June 28th, at Harley-street, W., the wife of Stanford Cade, F.R.C.S., of a daughter.

DONALD.—On June 25th, at a nursing home, Kensington, the wife of Charles Donald, F.R.C.S., of a son.

HUTCHINSON.—On June 29th, at Edwardes-terrace, Kensington, W., the wife of Samuel Hutchinson, M.R.C.S., of a daughter.

MOORE.—On June 28th, the wife of David L. H. Moore, M.B., of a daughter.

STANLEY.—On June 23rd, at rue des Belles Feuilles, Paris, the wife of E. Gerald Stanley, M.D., M.S., F.R.C.S., of a daughter.

MARRIAGES.

EDWARDS—SIMCOCK.—On June 27th, at St. Paul's Church, Heaton Moor, Manchester, Norman L. Edwards, M.B., F.R.C.S., to Margaret Simcock, M.B., eldest daughter of Dr. and Mrs. James Simcock, of Heaton Moor.

STEELE—THOMPSON.—On June 28th, at All Saints', Foots Cray, Kent, Tom Barton Steele, L.D.S. R.C.S. Eng., of Thorneycroft, Christchurch-road, Bournemouth, to Christine Lucy Winifred, only daughter of the late Richard Hanan Thompson, of Fairlight, Chislehurst, and the late Mrs. Thompson, of Upmeads, Dunbar-road, Bournemouth.

DEATHS.

CHETWOOD.—On June 28th, at Christopher-street, E.C., William Chetwood, M.R.C.S., L.R.C.P., aged 82 years.

CROOKSHANK.—On July 1st, suddenly, at Ridge Hill Manor, East Grinstead, Edgar March Crookshank, J.P., M.B., in his 70th year.

HEPWORTH.—On May 20th, at Camberwell, Victoria, Australia, Archibald Francklin Hepworth, L.R.C.P. & S.Edin., aged 61.

READE.—On June 30th, in London, Lt.-Col. William Lloyd Reade, R.A.M.C., aged 70 years.

THISTLE.—On June 26th, at Torquay, Frederick Thomas Thistle, M.D.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

HELPERS IN HYGIENE.*

BY ANDREW BALFOUR, C.B., C.M.G., M.D. EDIN.,

DIRECTOR, LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

THE remarkable changes which the last 25 years have witnessed would have heartened one keen helper in hygiene, the late Sir Benjamin Ward Richardson, a Victorian pioneer and somewhat of a seer in his day. He was the author of a notable book entitled "The Health of Nations," which all those interested in the history of hygienic endeavour should study but, for my present purpose, I would rather cite a passage in his "Vita Medica," that autobiography which he completed in 1896, two hours before he was seized with fatal illness. He has therein a chapter entitled "Efforts towards the Extinction of Disease," where he says: "The best idea, therefore, is that the disturbance or catastrophe called disease—excluding accidents—is not simply to be met by treatment, although that may be necessary and beneficial, but is to be prevented, and that with so much perfection that it shall altogether become extinct, or remain as a mere historical ghost."

Another prophet, though possibly a somewhat optimistic one, who happily is still with us, was the distinguished zoologist, Sir Ray Lankester, when he wrote, a good many years ago, that if we could only apply our present knowledge properly all communicable disease could be stamped out in the short course of 50 years.

Now neither of these men, shrewd, scientific, and well-informed, would have ventured to make such statements unless he had good reason for believing them to be true. They *had* good reason for, within the life-time of each, a veritable revolution had been wrought in our knowledge of the causes and spread of those diseases which can be transmitted from man to man or from some lower animal to man, with or without the aid of an intermediary, in other words, indirectly or directly.

Early Helpers.

It is sometimes forgotten, however, that long before Pasteur revealed the world of microbes and Manson showed how insects play a part in the spread of disease, many helpers in hygiene, by careful observation and sound reasoning, had reached conclusions which, when they translated them into action, yielded very gratifying results. True these men worked in the dark, but they did get hold of some essential facts and so, long before anything was known about the rôle of lice in typhus fever, Lind, the great naval surgeon of the eighteenth century, indicated clearly and correctly what measures would prove effective against that complaint. Similarly, other observers noted the connexion between dirt and diseases of various kinds, notably such intestinal disorders as diarrhœa and dysentery, and preached and practised a hygiene of environment. Long ago in Scotland there was a proverb, "the clartier (that is, the dirtier), the cosier," but the slogan of the health reformers was very rightly "the dirtier, the deadlier," and the deadlier, remember, not only to yourself and your family but to your neighbours and fellow citizens. These early reformers were very largely like voices crying in the wilderness. Few heeded them, save in communities like the Army and Navy where, if the officers commanding were believers, disciplinary measures could be taken, or where pressure could be brought to bear on local authorities and the Government, as when John Howard, shocked and horrified by the condition of the prisons, raised his voice and testified against them.

Mead and Howard, Percival, Ferrier and Currie, the civilians, Lind, Trotter and Blane, the naval surgeons, Pringle, Monro and Jackson, the Army hygienists, lived, laboured, and accomplished much good in a limited way. The country doctor, Jenner, by introducing vaccination, conferred upon suffering humanity one of the greatest boons ever vouchsafed to it and radically altered the situation with respect to small-pox and its victims. It was not, however, until Chadwick, the lawyer, came upon the scene and, with fearless enthusiasm, dogged determination and no little pugnacity, took up the cudgels on behalf of health, that any real and widespread progress was made, apart from what the good Lord Shaftesbury accomplished in the way of factory reform. Then and thereafter, however, a marvellous change ensued, mainly as a result of an organised campaign for cleanliness. What a fight it was, against superstitions and vested interests and supineness and bitter opposition! Although it is true that reform was in the air, that it was a period of quickening and advance in several directions, perhaps the battle might never have been successful had not the country been visited periodically by outbreaks of cholera which swept away hundreds. The scared populace was thankful to listen to those who brought a message of hope, more especially when Dr. John Snow showed that cholera was spread by the intestinal discharges of the sick and indicated polluted water as a source of infection. It was, in great measure, fear which made the people of England loosen their purse strings and provide the wherewithal to obtain pure water, clean dwellings, an efficient removal and disposal of filth and refuse, but, to do these Victorians justice, once they realised they were getting value for their money, they gladly bore the burden and so reaped the reward.

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* An address delivered under the auspices of the Isle of Man Red Cross Society at the conclusion of Health Week, March 4th, 1928. (Abridged.)

There were, however, other directions in which these early helpers of hygiene exhibited activity. The health of the individual was not altogether neglected though it is true that, for the most part, the individual received attention chiefly because he formed part of a community. It was, in other words, communal, rather than personal hygiene to which the earlier workers devoted themselves. Take, for example, Lind's efforts to get scurvy stamped out of the Navy by the issue to the individual sailor of a ration of lemon juice. Consider how the individual slave benefited from certain efforts affecting his personal welfare, made by Wilberforce and others in their campaign against the appalling conditions of the trade in black ivory.

Until quite recently I fancy that few had any idea that some of the recent developments on which we pride ourselves had their counterparts long ago. Dr. Mabel Buer, of Reading University, has unearthed some interesting facts which show that considerable attention was paid to infant and child welfare in the latter part of the eighteenth and the beginning of the nineteenth century. There was actually a baby clinic in London in 1815, the year of Waterloo.

Now, whence came these more enlightened ideas on the saving of young lives? From a study of the ancient Greeks, that nation of heroes, athletes, and philosophers who certainly were well versed in all matters relating to bodily health? It is unlikely. From the ancient Romans, that race which performed remarkable feats in sanitary engineering and had inherited some of the hygienic wisdom of the Greeks? It is improbable, for the Romans appear to have had little thought for child life.

John Peter Frank.

I cannot help wondering if it was not a legacy from a very remarkable man, a great helper in hygiene, and indeed not only a helper but a leader. So far as I can discover, his name and fame have in this country been wholly forgotten, though upon the Continent, where he lived and worked, they are remembered and they are known also to certain American hygienists. Perhaps in England there has been too great a tendency in matters hygienic to say we are, or were, the people and wisdom remains with us. In other words, knowing that England led the way in public health legislation, English students of the subject are a little apt to imagine that modern hygiene originated in this country and are not disposed to look abroad and see what other nations had done in pre-Chadwickian days. It is true that the English, first of all peoples, placed hygiene on a sound basis, established a definite system of organised sanitary control and enlisted the power of the law in regulating and enforcing public health procedure. Let us, however, remember that when England was sunk in dirt and squalor the cleanliness of the Dutch was proverbial: and let us pay homage to the memory of that leader of whom I spoke, who was no other than John Peter Frank.

His name will not be found in the Encyclopædia Britannica, though quite a respectable space is devoted to another Frank, one Jakob who, of all things on earth, was a Jewish theologian. Yet our Frank was once a name with which to conjure and Napoleon, no mean hygienist himself, tried in vain to obtain his services. He was born at Rotalben, in Bavaria, in 1745, the year before Culloden, when the death-rate in London was 50 per 1000—in 1926 it was 11·6—and life had an uncertainty about it to which it is now a stranger save in the matter of motor vehicles. His father was French. After studying at Heidelberg, Metz, and Strassburg, he gravitated to Göttingen and then to Pavia, eventually becoming Director-General for Sanitation in Lombardy somewhere about 1786. Think of that! In 1795 he was called to Vienna by the Emperor of Austria as consultant for the health of the troops. Thereafter we find him as a Professor at Vilna, then at St. Peterburg, and finally back again in Vienna, where he died, full of years and honours, in 1821.

He must have been a man of courage and humour. When he lay dying there were eight eminent doctors round his bed who had been summoned to attend him. He smiled and said: "This reminds me of the end of a French soldier wounded by eight musket shots at the battle of Wagram." "Morbleu!" said he, dying, "it takes not less than eight bullets to kill a French grenadier."

Frank was a voluminous writer and covered a wide field, but I mention him here because as a hygienist he was far ahead of his period and because he wrote a truly astonishing book entitled "System einer vollstandigen Medicinischen Polizey," This, the first authoritative work dealing with public hygiene, appeared in successive volumes between the years 1779 and 1817.

It dealt with nearly every aspect of hygienic activity, including what we are pleased to regard as modern developments. The author writes on sexual hygiene and maternity and child welfare. He discourses on the education of children. He considers the value of foundling institutes and orphanages, and looks at schools and gymnasia from the public health standpoint. A volume is devoted to the problems of nutrition; food and drink being considered and the importance of moderation stressed. Housing is discussed and public health conditions generally. The question of cemeteries is not forgotten, and there are disquisitions on the healing art and on schools of medicine. The importance of veterinary knowledge and its relations to medicine receive attention, and altogether it is startling to find how Frank anticipated posterity. I can find no record of his great work being translated into English or even into French, but a treatise which he wrote on the method of rearing healthy children was translated into the latter tongue and hence it is conceivable that it was *his* influence which led to the early movements in infant welfare of which we have spoken. In addition to being a great clinician, a man of affairs and an illustrious hygienist, Frank was a dreamer of dreams. He formed the conception of a State guided by public health considerations, a kind of Utopia wherein Hygeia should reign supreme, and where affairs would be conducted for the true and lasting benefit of mankind. It is not surprising that, with his knowledge and acumen, he should have conceived such an idea when, all around him, he saw the misery and wretchedness produced by successive wars and reflected on the welter of intrigue and politics as well as on the endeavours of the proletariat to obtain a place in the sun. Remember, he lived through the days of the French Revolution when, with much that was vile and repellent, there were the germs of great things and indeed in some ways the beginnings of a new world.

Reforms in England.

Whatever may have been Frank's influence on England, there can be no doubt he left his mark on the State medicine of Germany, Scandinavia, and Russia, but he lived, for the most part, in troublous times, and even after his death the Continental nations had not the means to put his precepts generally into practice. The man who followed him was Max von Pettenkofer, but we need not consider his exploits as a helper in hygiene. Rather let us skip the intervening years, including those when Sir John Simon as Dr. Simon and central medical officer to the General Board of Health, was making history, ably assisted by Southwood Smith and others, albeit remembering that Lecky has penned a noble epitaph for these stirring and fruitful times. He wrote: "The great work of sanitary reforms has been, perhaps, the noblest legislative achievement of our age, and if, measured by the suffering it has diminished, has probably done far more for the real happiness of mankind than all the many questions that make and unmake ministries." Its history is set forth in Simon's classic "English Sanitary Institutions." The fight was won but the position had to be maintained; and, furthermore, it soon became evident that the victory, though great, was not complete. In addition it came gradually to be recognised, as Frank had long before envisaged, that new methods of warfare had to be adopted. Let us dwell on these matters for a space. To maintain the position an adequate health organisation was required; and that is why England and Wales have now a Health Ministry, advised by a chief medical officer. Its medical department has separate sections dealing respectively with general health and epidemiology; maternity and child welfare, in which section very fittingly a woman is senior medical officer and the medical officers and inspectors are all women; tuberculosis and venereal disease; the supervision of food-supplies; general practitioner services; sanitary administration in relation to infectious diseases; and Welsh Board of Health to deal with the public health interests of the Principality.

The Work of Public Authorities.

I will comment on some of these immediately. Meanwhile, let us continue the tale and note that other central departments of Government have important health interests and so are helpers in hygiene. The Board of Education with all its responsibilities for the health of school-children and the sanitary condition of schools, the Home Office with its control of the health conditions in factories, mines, and workshops are appropriate examples.

The duties of the medical department of the Health Ministry are, speaking broadly, advisory and supervisory and cover a wide range which you will find listed in that masterly memorandum written by Sir George Newman and entitled "An Outline of the Practice of Preventive Medicine." Every community intent on hygienic progress and, more especially, every backward community striving to amend its ways, should be familiar with its pages. Perhaps the type of the Ministry's activities which will appeal most strongly to an audience of this kind is that whereby an expert is sent from the Ministry to assist the local health officer of a district where either some obscure infectious disease has made its appearance or where some communicable disorder is prevailing as an epidemic and has not yielded to ordinary measures. Medical officers of health greatly appreciate such skilled help, which is also naturally of very definite benefit to the local community and sometimes to the country as a whole. The official local helpers in hygiene are the councils of the areas into which the country is divided. These are the county councils. There is, as you know, a County of London and that county, small in area but packed with people, has its Council, and the Council has its medical and health organisation, a large and most important department charged with most onerous duties.

Outside London the work of the county councils is reinforced by that of the local sanitary authorities, be they urban, rural, or port. There are three types of urban local authorities—namely, the county boroughs, the municipal boroughs, and the urban districts—all acting through their respective councils. The county boroughs are represented by big towns, each with more than 50,000 people; the municipal boroughs are, as a rule, smaller towns; the urban districts, as the name implies, are also townships, and may indeed be very large and important places which happen never to have had conferred upon them by Parliament the title of county boroughs. As a type take Gosport, with its 33,000 people. The rural authorities are the councils of rural districts, which vary a good deal but which all answer to the description of country districts with comparatively small and scattered populations. In these districts, however, there may be small towns or clusters of villages. The state of matters as regards ports varies in different places and may be distinctly specialised. Great ports like London and Liverpool, for example, are under different guidance and control in health matters to the cities whose names they bear.

The Rank and File.

Now the councils of the above-mentioned boroughs and districts are concerned with various aspects of local government—not only with health work—and so, as a rule, at least in places of any size, the care of the people's health is entrusted to a public health committee. Such committees consist for the most part of laymen, and hence must have executive and advisory officers who are experts. These experts are the medical officers of health and in all important places, and I think I may say in all progressive and thoroughly up-to-date places, the medical officers of health are full-time officials. Here, in the great towns, the lesser towns, the villages, the countryside, we find what Newman calls the fighting-line of the never-ending, though usually unobstrusive campaign against inefficiency, disease and death. The medical officers of health and those who assist them and work with them, the sanitary inspectors, health visitors, and nurses, are, like Uriah the Hittite, in the forefront of the battle. So, too, are the executive officers of port health authorities. It is these men and women who are actually up against the forces of death, and remember that under the banner of the arch-destroyer there marches a multitude of legionaries, communicable and non-communicable diseases, ignorance, poverty, vice, drink, gluttony, greed, spite, selfishness, and so forth; it is these workers, the majority, capable and devoted, who are the greatest helpers in hygiene. They are the greatest in the sense that the private soldier, to whom Lord Haig paid tribute, is the greatest fighter. But for their numbers, skill, energy, patience, staunchness and devotion to duty, there would be another tale to tell from that which is told in the columns and obituary notices of the newspapers, in the medical press, and in the reports of the Health Ministry and of the Registrar-General. The commander-in-chief and his staff may plan a campaign. They cannot win it save through the deeds of the rank and file.

What are these deeds in the health campaign? It would take a long time to enumerate them in full, but from what has already been said you have no doubt gathered, if you knew it not previously, that they fall into two chief groups which we may conveniently term environmental and personal. The former are those which the pioneers in this country chiefly practised when they fought and won under the war cry—"Sanitas, sanitatis, omnia sanitas"; the latter embrace the principles which the far-sighted genius of Frank perceived to be essential and others which he did not visualise but which have established themselves throughout the fruitful years when the public health pendulum swung from the old order of things to the new.

The Menace of Dirt.

And here let me remark that, although it cannot be said to have swung too far, for the hygiene of the individual is of paramount importance, yet interest in the new has, I fear, led to some neglect of the old. How otherwise can one explain the filthy condition of some of our streets and highways, the shocking manner in which much of our food is handled, the refuse dumps one encounters in rural areas, foul blots upon fair scenes? It is true protests are raised but the faults continue, while one can imagine that in earlier days, say about 1860, the fervour of the reformers would have swept them away. Let us strive to preserve a balance and, in pursuit of new triumphs, not permit that insidious enemy, dirt, to regain positions from which he has been ousted. Even when dirt does not spell disease it leads to a lowering of tone, to a lack of self-respect, to a slackening of fibre. The trouble is partly due to the fact that much of the sanitation which formerly very closely concerned the medical officer of health has been relegated to other control. In the earlier days he had to fight like the devil, or shall we say like a good angel, to secure pure and sufficient water supplies, to get sewerage systems established, to ensure the healthiness of dwellings. Nowadays, for order has long since succeeded chaos, water supplies, sewerage and sewage works, house drainage and so forth are in the hands of competent engineers. Minor engineering and house sanitation are looked after by well-trained and certificated sanitary inspectors. Good and well, but from what I hear and what I see, I believe it would be an advantage if our medical officers of health had a little more time to keep in personal touch with these matters. This, I believe, is even more true in the case of the removal of nuisances and of refuse, one of the chief environmental duties in the olden days and still in tropical countries a most essential part of the health officer's routine.

As of yore the other environmental deeds comprise action relating to housing and town-planning, smoke prevention, the inspection of food, the control of infectious diseases, and inquiries into offensive trades. I cannot list them all but, with the exception of the control of infectious diseases, they have slipped a little into the background, for a multitude of activities relating to the hygiene of the individual now falls to the lot of the medical officer of health and certain of his assistants. In the matter of practical application these new duties are a product of this century and comprise maternity and child welfare work, the special and intensive control of tuberculosis, and the venereal diseases from the standpoint of the infected individual, the care of the health of the school child, the care of the blind, and occasional duties arising out of the National Health Insurance Act.

Formerly the great idea was to stamp out disease, especially communicable disease. That great idea persists, but along with it there is now the conception of rearing a sound and healthy race from the start, of extending the campaign to diseases called non-communicable, like rheumatism, rickets, and cancer, and even to minor maladies such as dental caries, oral sepsis, discharging ears, habitual constipation, the common but crippling cold, and the dyspepsias which cause so much chronic ill-health and lead to so much inefficiency. There is a move also towards investigating and dealing with worm infestations, which in the past have been somewhat neglected. Lastly, public education in hygiene has become a feature of the new campaign.

Innumerable Helpers.

Enough has been said to indicate that hygiene in this country must now be spelt with a very
evident that the health organisation is
it could scarcely fail to be, considering its origin, the way it developed, the fact that, over a long period of years, there have been shifts and adaptations and modifications, the manner in which new legislation has been grafted upon old, the necessity for conforming to altered conditions of life. Some of the helpers have been mentioned, but there are many others. The school teacher inculcating simple rules of health helps the cause, so does the wise parent, so does the child who puts precepts into practice. The schools of medicine help and will help more when they adopt as the chief object of their training the permeation of the medical curriculum with the preventive idea. Specialist medical officers help, like those in charge of tuberculosis and venereal disease clinics. In this category comes also the school medical officer and, despite all that is urged against him and his doings, the public vaccinator. The medical practitioner helps and his help will increase in value when he coöperates to a greater extent than at present with the officers of the Public Health Service and if and when the

idea of periodical health examinations takes root. The medical press helps and it is gratifying to note how much attention it now pays to the preventive side of medicine. Veterinarians help by dealing with tuberculous milk cows and stamping out diseases of animals transmissible to man. Employers of labour help when they make provision for the welfare of their staffs and employees. The tradesman helps when by his cleanly methods he handles human food in a way to command respect and confidence. I always take my hat off to the maiden in the sweetstuff shop who uses a scoop instead of her hand, be the latter never so dainty.

Those engaged in research help as, for instance, the great army of workers under the aegis of the Medical Research Council and those engaged in many scientific institutions upon problems affecting every branch of hygiene. There are many voluntary agencies, like the League of Red Cross Societies, which help, some more wisely than others, but all in some degree so that we recall an old proverb of Portugal which says: "One grain fills not a sack but helps his fellow." The lay press helps often very greatly; occasionally, perhaps, not to the best advantage, but with opportunities vouchsafed to few of those who aid the cause. Its influence in the past has been widespread and in the future will become more effective when those best fitted to advise the public can make use of its columns for propaganda purposes. The Church helps in various ways and might help more if it recognised to a greater extent that sick bodies are specially apt to be tenanted by sick souls and that there is something to be said for giving bodily and mental hygiene a first innings in any attempt to elevate the masses and improve moral tone. The Law helps, though it is better not to invoke its aid and to try what persuasion and education can do in the first instance.

But the lesson to-day is that everyone can help. There is no mystery about the business. Once a few essential facts are mastered simple rules of health can be adopted and practised by any person of average intelligence. A vast deal of public health practice is common sense applied to everyday affairs. Long ago it was different. A pall of ignorance shrouded the medical faculty and the laity alike. Visitations of disease were supposed to be the outpoured vials of wrath of an outraged deity. Superstition was rampant. Fatalism held sway. The people perished for lack of knowledge. Now all is changed and, though we are still ignorant in certain directions, for example, the causes of influenza, measles, and the so-called "sleepy sickness" still elude us, we have a firm grasp of principles and in large measure are masters of our fate. Who can doubt it? Consider what has happened.

The death-rate of the whole country has fallen to a figure which 50 years ago would have been regarded by many as beyond the dreams of the most optimistic. The infantile mortality has been halved in the course of a generation, the tuberculosis death-rate has steadily declined; some diseases have become extinct, others nearly so. The expectation of life, that is, the number of years a person may expect to live from the time of birth, has greatly increased—i.e., from about 45 in 1900 to 55 to-day. In the U.S.A. it is 58, in New Zealand 62. In British India, a land where hygiene has as yet made little progress, it is only 23. What we now have to fight is not so much death as damage. Life has not only become safer but infinitely more confortable, though there is still great need for improvement.

Monetary Value of Human Life.

The facts are convincing but these kinds of facts do not always appeal to the multitude and, in any case, there are many people, who, quite rightly, always consider the cost, their motto being, "Is the game worth the candle?" and their candle meaning hard cash. Not only so, but perhaps because there was some truth in Napoleon's sneer about a nation of shopkeepers not a few folk in Great Britain and, I take it, the Isle of Man, want return for their outlay, if not actually in what used to be called "jingling Geordies," at least in terms of guineas or of pounds, shillings, and pence. Both classes may rest satisfied for it is well worth while spending money on health, which is in a high degree a purchasable product, and, moreover, hygiene pays. It is a good and sound investment both for the individual and for the nation. If any sceptics remain, they will naturally say, "Submit your proofs and in plain language which can be understood, not camouflaged by scientific verbiage nor rendered unintelligible by the use of what the Scotch call 'lang-nebbit' words." Well, here they are!—a few of them—there is not time for many though they could easily be multiplied.

First, let us consider the monetary value of human life. What is that enigma, a human being, worth in coin of the realm? Well, his or her value varies according to age. The latest calculations come from America and are, of course, not applicable to this country, especially as they are based on earning capacity. However, it is interesting to consider them. Dublin and Lotka have recently shown that in 1924 the potential value of a male child at birth was no less than £1866 and, what is more, they have demonstrated that since 1901 its value has increased by £356, or nearly 20 per cent., owing to improved conditions.

Woods and Metzger have shown that in 1927 the average per capita value of the population of the United States was £3113. There have been more or less vague guesses on the subject this side of the Atlantic and one feels that Dr. Nankivell, the medical officer of health of Plymouth, was distinctly cautious when he said: "It is not an exaggeration to suppose that a life is worth on an average at least £100 to the community." Working on this modest basis and comparing the Plymouth of to-day with that of 70 years ago, he concludes that the improved health of the city represents a large annual financial saving which for 1926 he estimates at £100,000. "Nothing," he says, "costs the individual ratepayer more than sickness and mortality."

There we have a calculation concerned with all kinds of preventable disease. Let us look at another limited to a single malady but a malady which takes heavy toll and which is one of the "Four Scourges" to which Dr. Fremantle devotes a chapter in his interesting book, "The Health of the Nation." The malady is syphilis, that "hidden hand in pathology," as it has been called, and Colonel Harrison, writing about it in England and Wales, points out that "in 1920 there were reported to the clinics about 42,000 cases. Of these probably 6000 would have died of some sequel of syphilis had it not been for the treatment afforded by the free clinics." He assumes that the value of a man's life is £60, which he admits is a very low figure considering that the deaths would have occurred in persons at the most productive period of life. As a matter of fact, £500 would have been nearer the mark, and, as we have seen, in the United States an infinitely larger figure would be quoted. However, if we put it at £60 the loss would have been £360,000 by 1927. This represents only the saving of life. The average patient prior to death is ill for about three years. Hence the system of free treatment, a great ally of hygiene, by which many thousands of people are prevented from becoming burdens on the community at a time of life when they should be national assets, must be of immense value to the nation.

Take another disease—small-pox—which in a mild form we now permit to run riot in certain parts of England. Dr. D. Rocyn-Jones, the county medical officer of Monmouthshire, estimated that the recent small-pox outbreak there had cost the rate-payers £10,000 in capital expenditure and equipment, while the maintenance of 200 beds for six months means another £13,000. That is a pretty state of things brought about by the neglect of a measure the value of which in preventing small-pox has been abundantly proved and proved up to the hilt.

Health and Industry.

Sickness in relation to its cost in industry formed the title of an interesting paper by G. F. McArthur, the chief lady welfare superintendent of the London Midland and Scottish Railway Company. She quotes statistics issued by the Ministry of Health to show that, in 1926, there were 15,000,000 cases of individual sickness drawing benefits under the National Health Insurance Act, and that 27,000,000 weeks of working time were lost owing to illness, much of it, remember, if not most of it, preventable. The loss of wages to the workers is estimated roughly at a minimum of £30,000,000 and this means a corresponding loss to the nation in spending power. There remains the loss to production faintly reflected, as she puts it, in the 27,000,000 weeks of lost working time. Approximate though they admittedly are, these figures are probably under than above the mark and they should give one furiously to think. It must be clear that money spent in diminishing this drain is money well spent, and, as a matter of fact, a comparatively small expenditure will bring about a great reward and in two directions. As McArthur well says: "If every industry would examine its sickness costs with the same thoroughness as it examines its manufacturing costs, and with the same motive of reduction, the result would not only be to bring down the premium of the health insurance societies but to bring 'peace in industry' many milestones nearer its longed-for fulfilment." Prof. E. L. Collis, quoted by Dr. Deardon, is even more emphatic on the "savings" question. He considers that medical science properly applied to British industry would result in an annual saving in labour turnover of from £60,000,000 to £70,000,000, in lost time of £50,000,000 to £60,000,000, in industrial convalescence of many millions more, and that to assess the total saving at £140,000,000 a year would be quite reasonable and well within the range of possibilities. Lastly, for figures are apt to become wearisome, let me refer to an act of great significance. Insurance companies know the value of money and are careful about their investments. The American has never been accused of lack of appreciation of the dollar. Yet we find an American company, the Metropolitan Life Insurance, generously supporting public health work in Canada and the United States. Why? Because it is good business.

There is another aspect to this financial question which strengthens the argument that hygienic measures pay. In the absence of adequate preventive measures employers of labour may have to compensate their workpeople. Not very long ago, the widow of a coal-miner in Scotland obtained compensation because it was shown that her husband had died of a disease called infectious jaundice and that he had become infected in the pit from a rat or rats harbouring the parasite of that disease.

Sound Investments.

With all these facts and figures before us what are the investments which can safely be recommended to the inhabitants of this island? From a study of statistics and from information kindly supplied, it is clear that antituberculosis gilt-edged stock, if it can be secured, would yield good returns. Well, it can be got if, at the same time, we take some ordinary temperance, I do not say teetotal, shares and secure also some housing debentures. I call these debentures because money put into good houses and devoted to lessening overcrowding may well result in a repayment of principal in addition to interest. Segregation cumulative preference shares may be commended. In other words, put money into an hospital where cases of communicable disease can be received and the danger of spread of infection thereby lessened. Little or no result may be seen in one year but the time will come when this investment will prove a boon and a blessing. Milk bonds are indicated, for there is much need for the consumption of more milk and such milk should be pure and cheap. Douglas has already put money into what we may call ordinary water shares with the ordinary result, which at one time would have been looked upon as extraordinary, that typhoid fever has been abolished in the town. It still, however, lingers in the other districts and so antityphoid stock is indicated for purchase. It is, as has been hinted, of different kinds. Finally, funds may well be devoted to obtaining education trustee securities, another gilt-edged stock. Making ourselves trustees for public health propaganda we can put money into this type of investment without being liable for depreciation. In any case, there should be no depreciation, nor should any of these ventures fail. The Isle of Man is favoured in many ways. It is comparatively isolated during part of the year, and isolation in health matters has its advantages. Its climate has much to commend it. It enjoys a fair measure of prosperity and yet is free from the graver industrial problems. It is interested economically in keeping healthy, for it derives much of its revenue from its visitors, and typhoid and tourists are incompatible. Its death-rate, 14·6 per 1000 in 1926, is a fairly respectable figure and is less than its birth-rate. Its infantile mortality-rate is not very high and is improving. Altogether it would appear as if the Isle of Man, starting, it is hoped, on a new race for health, has an excellent handicap. There really seems no reason why it should not achieve a record. It would be a proud boast in years to come if this little island could wrest the laurel wreath from another island, from New Zealand, which has already achieved several records and is all out to make others. It is worth trying, for everyone benefits in the process except perhaps undertakers, sextons, and the proprietors of cemeteries and crematoria, and, after all, these good folk can never be quite ruined, for all must, in the long run, die. The great thing, however, is to die as we are meant to die, peacefully at a good old age, and to live as we are meant to live, healthily with sound minds in sound bodies.

ASSESSMENT OF RATES ON HOSPITAL BUILDINGS.

A MEETING was held at Brighton on June 26th to consider the position of charitable bodies under the new assessment of rates in the borough brought about by the Rating and Valuation Act, 1925. Mr. A. F. Graves, who has for many years been connected with a number of Brighton institutions, expressed the opinion that the assessments which the corporation valuer had arrived at were far too high. The institutions had, since 1875, been assessed at nominal figures, but the valuer had now assessed them at what he considered to be their true value, and no one, except Parliament, could alter those arrangements. Unfortunately, Mr. Graves said, the corporation had brought the Act into operation earlier than any other corporation in England, and that made it extraordinarily difficult to ascertain how charities were being treated elsewhere.

Mr. Graves had attempted to ascertain the position of institutions in other towns of about the same size as Brighton. At Burnley the hospitals were not assessed at their full value; in Sheffield special consideration was given them, the assessment working out at £1 per bed. In Birmingham and Portsmouth the cases were dealt with on their merits; and in Leeds the institutions were not assessed at their full rack rental, some concession being made. Mr. Graves contrasted the case of the Sheffield hospitals, rated at £1 per bed, with the position of the Royal Alexandra Hospital for Sick Children at Brighton, the new assessment of which worked out at £14 per bed. Even London hospitals, occupying sites the rental value of which must be enormous, were only assessed at £4 per bed. Mr. Graves instanced three examples of the effect of the new assessment at Brighton. The Royal Sussex County, which formerly paid £100 a year, was faced with a demand for £1600 a year in rates; the Children's Hospital demand had jumped from £16 to £500; and the Eye Hospital had gone up to £100 from its former figure of £17. As to the Children's Hospital, the amount to be paid in rates would practically absorb the whole of its income from subscriptions. It was impossible for the hospitals to raise the extra money to meet the extra demand. If the position was not cleared, hospitals and institutions would not be able to build an addition to their buildings, because they would be rated on them at the higher rate.

A resolution was carried requesting the borough Members of Parliament to take steps to secure the passing of a short Act of Parliament, or such other measures, for relieving hospitals and other charities of the liability for paying rates under the assessments being placed on charitable institutions under the Rating and Valuation Act, 1925, and that the Town Council be requested to receive a deputation from that meeting to discuss the effect of the new assessments upon local charities.

A BRUTAL SCHOOLMASTER.[1]

AN English translation by Mr. Cyrus Brooks, of the well-known German novel, "Die Ursache," explains fully the popularity of the original and justifies the reputation of the author. The story is simple, terrible, and, which is not the case as a rule with terrible stories, perfectly coherent. A young poet and journalist, who has suffered greatly under a brutal schoolmaster, on visiting his old school, finds the pedagogue maltreating a pupil with similar callousness. Accordingly he kills him, on impulse, and attempts, in defending himself on the charge of murder, to explain the excellent social motives which had led to the crime. Unfortunately he had taken a bank-note belonging to the victim in order to make good his escape, and so comprehensible a reason for the crime neutralises a defence which otherwise might have been regarded as a plea of lunacy. One juryman only inclines towards leniency, recognising something of the murderer's mental state. In describing the last hours and execution of the wretched convict, no details are omitted that might add to the horror of the situation. As a study in psychiatry (perhaps) and as an example of the literature of the terrible (certainly) the book is worth reading. The point of view of the criminal is, presumably, that his crime was justified, or had followed necessarily upon the resuscitated experiences of childhood; the jury only saw in it an ordinary case of theft with murderous violence. The verdict of an ordinary jury was inevitable, even though the mentality of the poet was misunderstood; a jury of psychologists might have been willing to substitute life-long confinement for the death sentence.

HOSPITALS FOR MIDDLE CLASSES: AN APPEAL.

AT the recent conference of the British Hospitals Association, Sir Thomas Horder referred to the need for some alternative to the private nursing home for patients of limited means. The administrator of St. Andrew's Hospital, Dollis Hill, Mr. W. E. Carton de Wiart, points out to us that a beginning in this direction was made as far back as 1913, when the institution over which he watches was opened for the reception of patients, who, while not suitable subjects for free treatment in charitable institutions, were yet unable to meet the charges necessary to secure adequate medical or surgical treatment in private nursing homes. This institution, which depends for its maintenance upon voluntary contributions and patients' payments, stands in its own grounds of 17 acres and is equipped with all modern requirements, while patients are admitted only on the recommendation of their medical adviser; there are no restrictions either as to nationality or creed. As the hospital is now well known, its accommodation of 52 beds is, of course, taxed beyond its limits, and there is urgent need for increasing the number of beds, and for the provision of a children's ward. The domestic provision for the staff, already inadequate, would become more so as a result of the enlargements. The improvements urgently needed are estimated to cost £30,000, and towards this sum £6600 are already available, and builders' plans have been prepared. If the necessary financial help were forthcoming, extension operations could proceed at once. Full particulars will be supplied on application to the Administrator, who makes out a good case for prompt assistance.

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[1] The Cause of the Crime, by Leonhard Frank. London: Peter Davies, Ltd. 1928. Pp. 188. 6s.

Observations
ON
DIVERTICULA OF THE COLON:
A PATHOLOGICAL AND CLINICAL STUDY.

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In 1858, at a meeting of the Pathological Society of London, Sydney Jones reported the case of a man who had suffered from a fistulous communication between the bladder and the bowel, secondary to an inflamed and ulcerated diverticulum of the sigmoid flexure. In spite of this striking demonstration, nearly 70 years ago, of the existence of diverticula of the large bowel as distinct entities, and also of their rôle in the production of grave pathological processes, it was not until 1898 that Graser, by emphasising their importance in the production of stenosing types of inflammation simulating carcinoma, caused attention to be seriously focused on them for the first time. Then the contributions of Mayo, Wilson and Giffin, Beer and Brewer in America, and of Moynihan and Telling in England, established diverticulitis as a well-defined clinical entity with definite sequelæ. In spite of the extensive literature which has since grown up around the subject, diverticulitis cannot be said to be a common disease. At the Mayo Clinic, however, such a wealth of clinical and pathological material bearing on this subject has been available that a study of the disease from all aspects has been rendered possible. Especially has one been able to collect data with reference to the frequency of occurrence of diverticula of the lower bowel, the frequency and character of the pathological changes which may be superadded, as well as to those measures which have been found most successful in the treatment of the latter. The material has been gathered from the post-mortem room, and from the operating room were obtained resected specimens from cases of surgical diverticulitis. For clinical data, the records of cases occurring at the Mayo Clinic during the last 15 years have been consulted.

Incidence and Distribution.

The most recent radiological records of the incidence of diverticula are those by Spriggs and Larimore. In a series of 1000 radiological examinations of the colon Spriggs found diverticula in 10 per cent. Larimore found diverticula in 1·24 per cent. of 4406 cases. At the Mayo Clinic, in 1925, diverticula were found in 5 per cent. of cases in a series of 4484 radiological examinations of the colon. From April 1st, 1923, to April 1st, 1924, in 498 necropsies at the Clinic (excluding partial necropsies and necropsies on still-born children), diverticula were found in 34 cases (about 7 per cent.). All but two of the patients in this series were over 45 years of age. Making the necessary corrections, one could say that roughly 13 per cent., or one person in eight over the age of 45, showed diverticular formation in the large bowel. It was found almost twice as often in men as in women, although there was no marked preponderance of males over females in the total series studied.

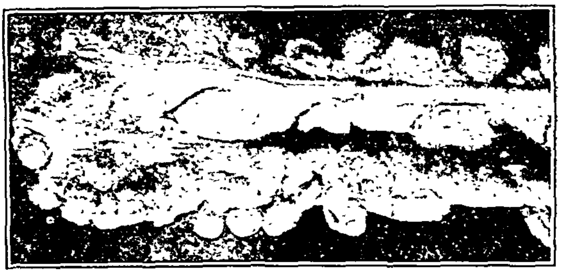
In 53 specimens examined, diverticula were confined to the sigmoid flexure alone in 22 cases (40 per cent.). They were scattered throughout the entire colon in 16 cases (30 per cent.). Rarely the cæcum, ascending colon, splenic flexure, and upper rectum were each involved, alone or with the sigmoid. The point to be emphasised is that the sigmoid is involved in between 70 and 80 per cent. of the total number of cases showing diverticular formation; these findings correspond closely with those determined by X ray examination. Moynihan stresses the appendix as a very common site; this was not borne out in the post mortem series examined.

Macroscopic Appearance.

Diverticula in the large bowel vary from almost microscopic dimensions to about 2 cm. in diameter. They have been seen as large as 4 cm. in diameter, but this is exceptional, and there appears to be definite limitation to their capacity for growth and development.

In situ they are almost completely concealed from view because of their tendency to occur in that part of the intestine that is heavily laden with fat. The increase of the subserous fat and the coalescence of the appendices epiploicæ may cause a distinctive tuberous appearance of the bowel. When the fat is stripped, the diverticula are seen typically as bluish-black flask-shaped or pyriform outpouchings, set roughly in two parallel rows. This colour is distinctive of the so-called false diverticulum, in which mucosa and submucosa are herniated through the muscular coat. At the base or neck, the muscularis passes up for a short distance on the wall of the diverticulum, forming a narrow whitish strip or collar which is easily distinguished from the bluish fundus or cupola beyond. Only about 75 per cent. of the cases examined, however, showed increase in the subserous fat and in the size of the appendices epiploicæ. In the remainder, where there was no such increase, the patients were either old or had died from malignant disease in which cachexia was prominent. In one or two instances the fatty increase appeared to be strictly localised to the site of the diverticula. This may be explained partly by the tendency of diverticula to extend into and expand the appendices epiploicæ.

FIG. 1.



Multiple diverticula of the sigmoid flexure. The fat of the epiploic appendages has been removed to demonstrate the sac more clearly. Relationship to the longitudinal muscle bands and disposition roughly in two rows may be noted.

The bluish-black appearance of false diverticula is dependent on the presence of fæcal matter within the lumen. Fæcoliths, however, are not invariably found, even in sigmoid diverticula, although spasticity in this area, coupled with the inspissated nature of the intestinal contents, certainly makes them common. Small diverticula with wide mouths, occurring in the non-spastic bowel, often contain no fæcal matter at the time of examination, and are pale and collapsed. Viewed from the mucosal aspect of the bowel, the appearances depend on the presence of spasticity or rugosity of the mucosa. In about 60 per cent. of the series examined, the mucosa of the sigmoid was thrown into rugæ, running slightly obliquely, and the openings of the diverticula were in the depths of the furrows so formed. In the sigmoid the orifices usually appeared as small slits, elongated in the direction of the rugæ. Where diverticula appeared in a non-spastic gut, the orifices tended to be wider, and the mucosa of the diverticula tended to prolapse slightly into the main lumen of the bowel, so that the orifice appeared as if set on a small papilla.

Even when diverticula are multiple throughout the colon, they are almost invariably scarce in the cæcum and ascending colon. Moreover, they are smaller than diverticula of the sigmoid, for they are not subjected to the stretching dependent on the accumulation of fæcal matter within them. Spasticity in this portion is usually absent, the orifices of the diverticula are wide and generally somewhat raised from the plane of the mucosa of the bowel, producing the papillar appearance. These diverticula are usually empty, and can be readily invaginated into the interior of the bowel. The transverse colon, on the other hand, is often spastic, and the multiple small segmentations into which this portion is thrown by the contraction of the longitudinal tæniæ may give, prima facie, a close mimicry of diverticular formation.

Although diverticula may be numerous in the lower sigmoid, they are rare in the upper rectum, probably owing to the greater thickness of its wall. The rectum was affected in two cases only in the series studied.

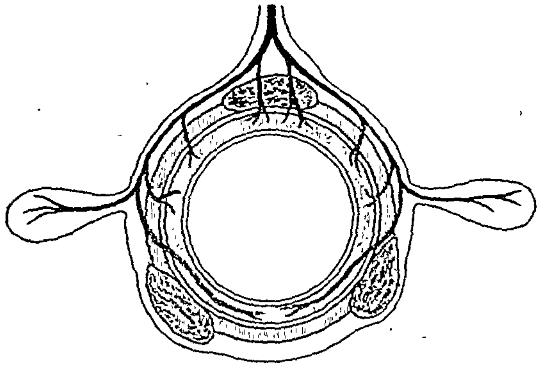
Their Site in Relation to Circumference of the Bowel.

The exact situation of diverticula in relation to the circumference of the bowel is remarkably constant. They appear between the mesocolic and the antimesenteric longitudinal muscle bands, rather closer to the latter than to the former. The diverticula are definitely related to the blood-vessels entering from the mesentery.

It will be seen from Fig. 2 how easy it is for a diverticulum, once it has extended beyond the plane of the muscular coat, to pass into an appendix epiploica. While this is common, it is not invariable. I have never seen diverticula of the large bowel entering between the two leaves of the mesentery as diverticula of the small intestine are so apt to do, and in only one instance have I seen them appearing on the antimesenteric aspect of the bowel between the two antimesenteric muscle bands. When numerous in the sigmoid, however, they may not confine themselves strictly to the vessel points, but, as a result of the generalised weakening of the musculature, they may crop out promiscuously all over the area between the mesocolic and the antimesenteric longitudinal muscle bands. I have seen one instance in which the diverticula were splitting the fibres of the longitudinal muscle band.

The segmental contractions of the bowel force fæcal matter into the diverticula and the narrow orifices, and the lack of muscular coat in the expanded portions prevents its expulsion. The fæcal matter becomes moulded to the shape of the diverticular cavity and forms a concretion which usually resembles closely, both in shape and consistency, those in the appendix. They are easily removable, although occasionally I have seen them so closely incorporated with, and adherent to, the mucosal lining of the sac that the lining was completely stripped off by the attempt to remove the concretion. Even in the sigmoid, however, the contents of the diverticula are often quite soft, and in the remaining portion of the large intestine, particularly the ascending and transverse colon, the diverticula are often empty, or are filled with soft fæcal matter. This, of course, is due largely to the well-established physiological fact that, generally speaking, the contents of the right half of the colon are fluid and of the left half solid.

FIG. 2.



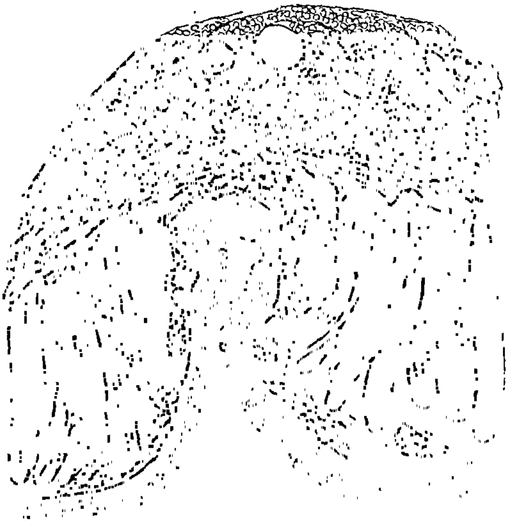
The point near the antimesenteric muscle bands, where the muscular coat is pierced by the blood-vessel entering from the mesentery, is an area of lessened resistance, and constitutes the seat of election for diverticula (after Drummond).

Development and Microscopic Anatomy of Diverticula.

Diverticula first appear as little pits in the mucosa. Mucosa and submucosa then extend up through the circular muscle coat, and in the earliest stages may look like exaggerated spasticity of the bowel.

Arriving at the longitudinal muscle coat, the growing diverticulum either breaks through this or carries it in front of it. In Fig. 3, both circular and longitudinal coats have given way, and the outpouching is ready to extend beyond the plane of the bowel as a so-called "false" diverticulum. In other cases the longitudinal coat, although thin, appears to remain intact for a considerable time, but ultimately undergoes pressure atrophy from the continued growth of the diverticulum. In Fig. 4, for instance, muscular fibres can be traced along the wall of the diverticulum for at least half the distance towards the fundus. Beyond this, Van Gieson's stain demonstrated considerably fragmented muscle-fibres around the fundus of the saccule, gradually being replaced by fibrous connective tissue. The ultimate outcome, in most cases, is a diverticulum of the "false" type, lacking muscular coat.

FIG. 3.



Camera lucida drawing of a diverticulum. The sac is breaking through the longitudinal muscle coat.

Fig. 4 is typical of the appearance of the average false diverticulum of the sigmoid. It shows the rather redundant mucosa of the main lumen of the bowel, the narrow neck of the diverticulum where it passes through the muscular coat, and where, in the absence of a fæcolith extending to the orifice, the spasticity keeps the opposing walls in contact. Beyond is the pyriform expansion into the appendix epiploica. The mucous lining of the diverticulum is normal.

I believe the final tendency in all diverticula of the large bowel is towards the production of the false type of sac. On the other hand, in a certain proportion of diverticula a muscular coat is retained, and these can be classified as true diverticula. At the same time, it is probable that they are simply stages in the development towards the false type. Again, if chronic inflammatory changes develop around diverticula, their further growth tends to be arrested.

ÆTIOLOGY.

The first aspect of the problem to be considered is whether the diverticula are congenital or acquired, or whether there are two distinct types. The fact that several cases have been described at early ages favours a congenital basis, and there is also the association, in a proportion of cases, with diverticula elsewhere in the body. In the 53 cases examined post mortem, diverticula of the colon were found associated with diverticula of the duodenum in four cases, with diverticula of the jejunum in two, and with diverticula of the bladder in two. In other words, the coexistence is not common enough to favour a congenital origin. That diverticula of the colon are sometimes congenital must, *I think*, be admitted, but they are rare. The cases reported by Hartwell and by Fütterer and Mitteldorph are undoubtedly congenital.

Acquired Diverticula.—As a rule, the occurrence of diverticula in middle and later life is overwhelming vidence that they are acquired. The age-incidence n 100 cases of diverticulitis verified by operation is shown in Table I. Eighty-five per cent. of the patients in this series were between the ages of 40 and 70, so that apparently diverticula begin to affect persons in middle life, and are especially common in advanced middle age and old age.

TABLE I.—*Age-incidence in 100 Cases of Diverticulitis.*

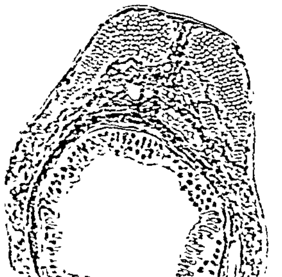
Age.	M.	F.	Age.	M.	F
20 to 30	0	1	50 to 60	25	11
30 to 40	6	4	60 to 70	19	5
40 to 50	17	8	70 to 80	3	1

TABLE II.—*Average Weight of Patients in Clinical Series.*

—	Cases.	Av. weight in lb. previous to onset of symptoms.	Av. weight in lb. at time of exam.
Males	55	179	166
Females	20	157	149

The earlier observers, including Graser and Hansemann, stressed the repeated increases in pressure from constipation and gaseous distension as being important factors in ætiology, but there are many reasons for believing that if the wall of the bowel is of normal elasticity there is no apparent distension clinically which will produce diverticula. Again, though Graser, Hansemann, Hanau, and Klebs concentrated on the vessel points in the bowel wall as constituting the key to the ætiology of diverticula, these vessel points are probably to be regarded more correctly as determining the site of the diverticula than as important ætiological factors in their formation. Most observers have noted the tendency for diverticula to occur in rather obese persons, but the obesity in these cases is most probably the concomitant of middle age and its attendant restricted physical activity, with resultant lowered plane of metabolism and less perfect oxygenation of the tissues. With few exceptions diverticula occur after the age of 40, when the patient is entering on the degenerative period of life. It seems logical enough to assume that the loss of tone and elasticity of muscle which accompanies advancing years is not confined to striated muscle, but affects the unstriped muscle throughout the body, including that of the intestine. Recently Spriggs and Marxer, from a series of excellent radiological studies, suggest that the diverticula may result from a preceding inflammatory process, but in my own pathological studies I was unable to demonstrate this.

FIG. 4.



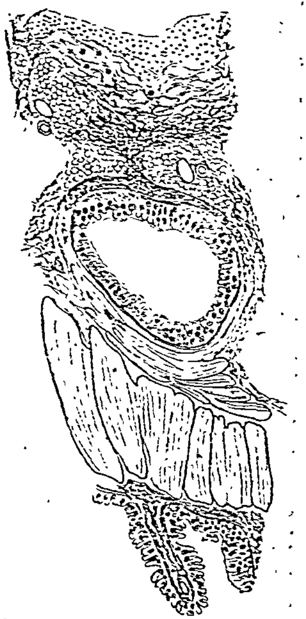
Camera lucida drawing of a diverticulum passing into the epiploic appendage. Muscle - fibres were demonstrated around the fundus of the diverticulum. A mild degree of subserous fibrosis may be noted.

SECONDARY CHANGES.

The secondary pathological processes superimposed on diverticula may be divided into mechanical and inflammatory.

Mechanical Processes.—Fæcal concretions may produce mechanical irritation of the mucosa of the diverticulum, bringing about a condition favourable to the multiplication of micro-organisms and to their passage beyond the lumen of the diverticulum. Since concretions of considerable hardness are found only in the sigmoid flexure, it follows that for practical purposes inflammatory conditions superimposed on diverticula are confined to this region. The right half of the colon, where the intestinal contents are fluid, is practically immune. However, it is remarkable to what extent the mucosal lining of a diverticulum may be thinned out through pressure atrophy from a concretion and yet inflammatory changes be absent. Fæcal concretions often project slightly into the main lumen of the bowel and the tip may be exposed to pressure from the main bulk of the fæcal mass. Cases of sudden pistol-shot perforation occurring during strain have been described by Murray. In the series of cases at the Mayo Clinic there was no record of such an accident. The presence of foreign bodies other than fæcal concretions has been described by Bland-Sutton. These have been accused of setting up inflammation.

FIG. 5.



Diverticulum in cross section. A collection of lymphocytes, and, incidentally, grades of inflammatory reaction in the subserous coat may be noted.

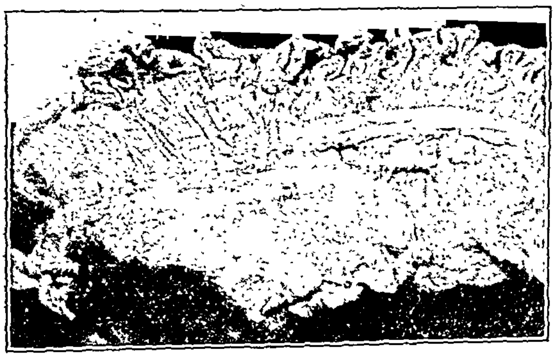
Inflammatory Changes in Diverticula.—Theoretically, one would consider the diverticulum with its irritating and infected fæcal contents to be an ideal nidus for the development of micro-organisms, and for the occurrence of inflammation of varying grades of severity. This does certainly occur, but comparatively seldom. Of 34 cases in which diverticula were found post mortem in one year, only one showed chronic inflammatory subserous changes of any degree of severity, and even in this case the inflammation was latent and asymptomatic. Three or four cases showed microscopically mild chronic inflammatory changes in the subserous fat. In the remainder no inflammatory changes were found. This point is worth emphasising. Radiologically, diverticula are by far the most common lesions in the colon; they are at least three times more common than the next most common lesions—namely, carcinoma and ulcerative colitis. Diverticulitis, on the other hand, is rare, and probably not more than 10 per cent. of the cases ever require surgical intervention for gross inflammatory complications. It is for this reason that the term diverticulosis, referring to the mere presence of uncomplicated diverticula, is preferable; the term diverticulitis should be reserved for the relatively small number of cases that give evidence of superadded inflammation.

Inflammatory changes in and around diverticula may be arbitrarily divided into acute and chronic. Acute infections are often superimposed on chronic inflammatory changes and the latter are much more common.

In the *mild* types, little may be seen by the naked eye to draw attention to secondary inflammatory changes. Often, however, the fat of the appendices epiploicæ is rather coarser and more fibrous than usual. Microscopically, the mucosa of the diverticulum may be almost normal, or slightly atrophied from the pressure of the concretion. Towards the fundus or apex of the diverticulum small collections of lymphocytic cells may be seen in the deeper parts of the mucosa (Fig. 5). These are irregular in distribution and may overlap the muscularis mucosæ so as to give the appearance of gaps in its continuity. These collections of lymphocytic cells resemble lymphoid follicles except that they are irregular in shape and distribution and do not have the appearance of a germinal centre. The solitary follicles may be found lying alongside them and are then quite easily distinguished. These lymphocytes are the response to the extension from the cavity of the diverticulum into the surrounding tissues of an attenuated poison—toxins of bacteria rather than the bacteria themselves. Outside the diverticulum there is some fibrous connective tissue in the immediate neighbourhood of the fundus, indicating the source of the chronic irritation from which it originated. The submucous fibrous coat, which followed the mucosa in its herniation through the muscle, is compressed into a compact and dense layer which usually cannot be well distinguished from the new fibrous connective tissue.

The *severer* grades of chronic inflammation are far more important from the surgical standpoint. In Fig. 6 the long narrow diverticula are seen passing up between the rugæ and extending beyond the muscular coat. In the subserous coat the thick layer of fat has been almost entirely replaced by dense white fibrous connective tissue, forming a homogeneous layer about 3 cm. in thickness, dull pearly-white, and cutting almost with the consistency of an unripe pear, so that it closely resembles carcinoma. Under the microscope, the mucosa, submucosa, and muscle coat show practically no changes, and there may be only very slight evidence of chronic inflammation in the mucosa of the diverticulum, manifested by a few foci of lymphocytes towards the fundus, slight mucosal atrophy, and diminution in the number of the gland crypts. The changes in the neighbouring subserous coat are most striking. It is for this reason that Wilson some years ago suggested the term "peridiverticulitis" as being more appropriate. All grades of transition from the original subserous fat to complete replacement by dense fibrous connective tissue are met with. The fibrous tissue is denser and less cellular in the immediate vicinity of the diverticula, while beyond, where the fat replacement is not complete, the connective tissue is younger and more vascular, and cells of inflammatory origin may be present. Small collections of lymphocytic cells are found in the region of the blood-vessels, and are sometimes seen extending in long lines along the lymph spaces between the fat cells. Fibroblasts appear, and young cellular and vascular tissue is formed. Towards the serous coat the process is less advanced, and fibrocellular strands can be seen extending between the fat cells (Fig. 7). Besides lymphocytes, there are lamellar connective tissue cells and plasma cells. Plasma cells, however, are seen only in the subacute or acute types of inflammation.

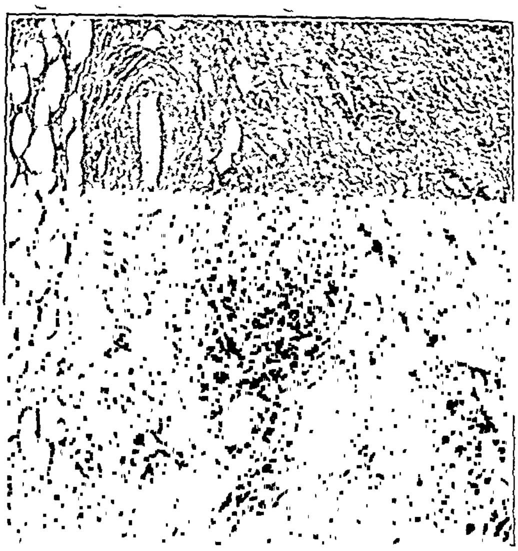
FIG. 6.



Portion of sigmoid removed at operation showing fairly typical diverticulitis and peridiverticulitis.

The final tendency is towards the formation of dense and more avascular connective tissue, replacing the normal structure of the subserous coat of the bowel. This renders the intestinal wall rigid, so that it loses its contractile and propulsive character and favours stasis. Again, the contraction of the fibrous tissue increases the already existing rugosity of the mucosa and consequently reduces the lumen. The last factor which may aid in the production of obstruction is angulation of the bowel, which is the result of adhesions and chronic inflammatory changes in the mesentery of the sigmoid. Peridiverticulitis of any degree is rarely present without some coexisting reaction of the peritoneal coat, and often the reaction is more acute in the peritoneum than throughout the rest of the bowel wall. The mobility of the sigmoid, together with this adhesive peritonitis, results in adhesions to adjacent viscera, and also of one loop of sigmoid to another; the latter is still further favoured by chronic inflammatory changes in the sigmoid mesentery, which shorten it and approximate adjacent loops.

FIG. 7.



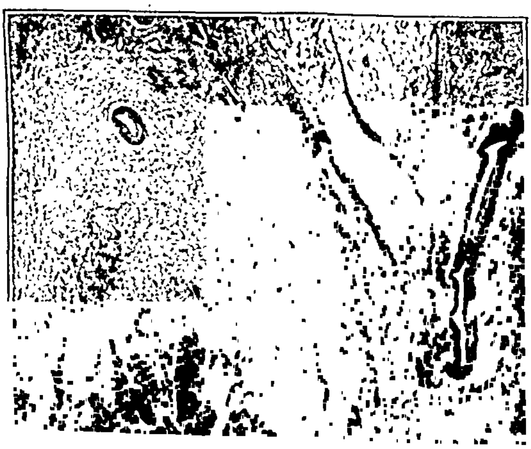
A portion of the subserous coat of the bowel, the seat of peridiverticulitis. A collection of lymphocytic cells, and early replacement of the fat by fibrous connective tissue, may be noted. (×150.)

The occurrence of acute inflammation in and around diverticula is dependent on the presence of particularly virulent micro-organisms rather than on any great weakening of the defensive barrier formed by the wall of the diverticulum. The most common organism found is a diplo-streptococcus, and this is often associated with Gram-positive bacilli resembling the anaerobic Welch bacillus. These acute inflammatory changes can be divided into two groups: those in which there is gross rupture of the wall of the diverticulum, and those in which the inflammatory changes within the diverticulum are milder, and the wall of the diverticulum apparently becomes permeable to micro-organisms without any demonstrable solution in its continuity. In the latter group it is often difficult to identify the diverticulum or, more rarely, diverticula responsible for the acute inflammatory changes. In the first group it is much easier, for there is usually an intense inflammatory zone, visible macroscopically, immediately surrounding the diverticulum. In the cases in which the diverticula are apparently intact, the organisms pass to the surface and the peritoneum shows the greatest degree of reaction, while the other coats may show relatively little change. It is this type of case which presented so much difficulty in the days before the significance of diverticula was recognised, and it was thought that the source of the peritonitis was extrinsic to the bowel. This is the "pericolitis sinistra" of Rolleston.

Acute inflammatory complications in and around diverticula can occur either as the first manifestation of infection in the diverticula, or in association with chronic peridiverticulitis of long standing; these may present considerable differences as regards prognosis and sequelæ. Diverticula with a thin fatty subserous covering, in which fibrous changes are slight or absent, readily permit of acute involvement of the peritoneum. Inasmuch as no adhesions have formed, the resultant peritonitis may be widespread, though it rarely becomes generalised. On the other hand, if the diverticula are embedded in a thick layer of fat, and especially if there has been considerable subserous fibrosis, acute infection will travel to the surface just the same, but the sigmoid will have formed adhesions to the side wall of the pelvis or to adjacent viscera and a localised abscess is the most serious complication likely to result.

In the central area of the lumen of the diverticulum (Fig. 8) a portion of the inflammatory exudate, consisting of polymorphonuclear leucocytes, may be seen held together by a small quantity of fibrin. The gland crypts show necrosis of portions en masse, and the process is not so much a simple catarrhal desquamation of cells as a more severe type of inflammation in which necrosis is the prominent feature. Several of the crypts are seen to contain inflammatory cellular exudate, and one of the outlying crypts is seen to have perforated. The muscularis mucosæ and the submucous coat around the apex of the diverticulum have disappeared, and the subserous fibrous connective tissue in the immediate zone has been replaced by massive cellular exudation in which polymorphonuclears, lymphocytes, and plasma cells are intermingled. The reaction outside the diverticulum is more marked than in the diverticulum itself, probably because the main blood-vessels are just outside the sac, and the exudative phenomena are more prominent there. Towards the serous coat, the inflammation is subacute, but well-marked acute peritonitis is present. The microscopic picture in these cases of acute diverticulitis varies a little according to the virulence of the reaction, but the foregoing features are fairly typical. To these may be added great distension of the lymph spaces with serum, distension and congestion of blood-vessels, and sometimes small localised abscesses in the subserous coat.

FIG. 8.



Low-pow[illegible] ely inflamed diverticulum. A [illegible] eucocytes in the lumen of th[illegible] and necrosis of the com- po[illegible] is an acute inflammatory zone surrounding the diverticulum. (×25.)

SEQUELÆ.

All grades of severity of peritonitis occur, depending on the virulence of the original infection. Unlike the similar process in the appendix, acute diverticulitis rarely gives rise to generalised peritonitis. Localised pelvic peritonitis or localised abscess is the usual sequel. In 74 cases of peritonitis and abscess, 24 presented evidence of acute peritonitis, invariably localised to the pelvis, and in 15 cases an abscess or abscesses were present (Table III). In 10 cases the peritonitis was classified as subacute at the time of operation, and in 26 cases it was chronic, manifested by adhesions to neighbouring viscera. In five cases the lesion was mainly in the mesentery, one case showing acute mesenteritis. In one instance, multiple small abscesses were found, but in the remainder of the 15 cases the abscess was single. Inasmuch as these abscesses are usually found in a mass of adhesions, they may have existed for a considerable time previous to operation; as a consequence, the pus in the older abscesses is often thick and sterile. They rarely contain more than 30 c.cm. of pus. Occasionally, however, when they have formed under the abdominal wall, they have been incised through the skin and considerable pus evacuated.

TABLE III.—*Position of Abscess.*

	Cases.
Between sigmoid and abdominal wall	3
,, ,, and adherent ileum	4
,, ,, or rectum and bladder	3
,, ,, and side wall of the pelvis ..	2
,, ,, cæcum and appendix	2
In the mesentery	1

Adhesions.—There is a distinct tendency for the sigmoid, which is the seat of diverticulitis and peridiverticulitis, to become adherent to surrounding structures, and this is favoured by the mobility of the sigmoid loop. The adhesions may localise infection, but they also predispose to formation of the fistula and may make radical surgical procedures difficult. Of 100 cases of diverticulitis investigated, adhesions were present in 74. The organs or structures to which the sigmoid was found adherent, together with the relative frequency of these adhesions, is given in Table IV. Adhesions to the bladder are the most common and the most significant. In 14 of the 24 cases, a vesico-sigmoidal fistula had formed. In the 20 cases in which the sigmoid was adherent to the side wall of the pelvis, the most vital structures affected were the left common iliac vessels and the left ureter. In nine cases the left ureter was densely bound down in adhesions, and in one case there was sufficient obstruction to the lower end to produce marked dilatation above. In only one of the 12 cases in which the sigmoid was adherent to the small intestine had actual perforation taken place. In one of the five cases in which the cæcum and appendix were adherent, the tip of the appendix was found lying in an abscess between the sigmoid and the cæcum, but the source of the abscess was diverticulitis and not appendicitis.

TABLE IV.—*Site of Adhesions.*

	Cases.		Cases.
Bladder	24	Cæcum	2
Left side wall of pelvis ..	20	Appendix	3
Small intestine	12	Abdominal wall ..	6
Left adnexa	3	Sigmoid	2
Right adnexa	1	Descending colon ..	1
Uterus	2	Generalised	8

Association of Diverticulitis with Carcinoma and Tuberculosis.

Carcinoma of the sigmoid occurs with diverticula in certain cases. In 1917 W. J. Mayo reported it in 13 out of a series of 42 cases. Inasmuch as chronic irritation in other situations has long been recognised as a factor in the production of cancer, it is certainly plausible to regard prolonged diverticulitis as a precancerous condition. Wilson, as early as 1911, drew attention to the apparently close relationship of the two conditions and reported four cases.

I have examined eight cases in which diverticula or diverticulitis coexisted with carcinoma. Without giving the detailed macroscopic and microscopic descriptions on which my opinions are based, I would summarise my findings by saying that the question whether the carcinoma develops propter hoc and not simply post hoc must remain undecided, but my impression is that the malignant process starts in the main lumen of the bowel and not in the diverticula, although the latter may be involved by extension. The gross inflammatory changes in these cases are, I believe, more often dependent on the malignant disease than on the diverticula. It is impossible to determine whether a chronic inflammatory process affecting chiefly the subserous layer can have much effect in determining the genesis of carcinoma in the main lumen of the bowel. In one case the carcinoma involved the recto-sigmoid, while the mass from peridiverticulitis formed a localised tumour several inches higher in the sigmoid, the intervening area of bowel being apparently normal. W. J. Mayo states that, excluding the stomach, most gastro-intestinal cancers are situated at the recto-sigmoid. Diverticulitis, on the other hand, is just as likely to affect the sigmoid higher up. Since approximately one person in every eight over the age of 45 has diverticula of the sigmoid, and since diverticulitis and carcinoma are most common at the same age period, it is reasonable to assume that they will coexist in a certain proportion of cases. I believe that the degenerative changes in the sigmoid consequent on advanced middle age, constitute a common factor responsible both for the occurrence of diverticula and for the higher incidence of carcinoma at this age.

In two cases tuberculosis of the sigmoid was found coexistent with diverticulitis. These are discussed in another article. Hyperplastic tuberculosis of the sigmoid gives a pathological appearance which is almost identical with that of diverticulitis, and when both occur in the same segment of bowel, there is great difficulty in assessing the rôle which each plays in the pathological picture produced.

CLINICAL FEATURES.

In the absence of inflammatory changes, diverticula may not cause symptoms. However, the colon which is the seat of diverticulosis is often spastic and there may be considerable constipation. Even then it may be difficult to determine whether the constipation is due to diverticula or to the habit of the individual. On the other hand, this spasticity may be so marked as to cause symptoms suggestive of organic obstruction, and one is frequently surprised at operation to find but slight interference with the calibre of the bowel when the severity of the clinical symptoms had suggested moderately severe organic stenosis. Again, when inflammatory complications are present, even though there are only one or two diverticula in the sigmoid, one may become acutely inflamed and thus bring the patient to the surgeon. In such cases obstruction may not be a feature, and there may be little previous history to direct one's attention to diverticulosis of the sigmoid as the probable ætiological agent. In most cases there is gradually increasing stenosis of the bowel from chronic diverticulitis and peridiverticulitis, producing more or less constipation. From time to time, however, superadded acute inflammation may cause a flare-up, during which the sigmoid becomes swollen and tender, and partial or complete obstruction may supervene. The patient may seek advice during the first of these attacks, or may pass through several of them with partial or complete relief in the intervening period. Many of the patients come to the physician with complaints which immediately suggest an investigation of the left lower quadrant of the abdomen, but this is not invariable (Table V.).

TABLE V.—*Primary Complaint in Cases of Diverticulitis.*

	Cases.
Pain in left iliac fossa	42
Urinary symptoms	16
Pain in both lower quadrants	11
Increasing constipation	13
Abdominal pain not localised	8
Epigastric distress	4
Pain in region of umbilicus	3
Pain in rectum	3
Bleeding from the bowel	5
Diarrhœa	4

Classification of Cases.

I found that these 100 cases fell, roughly, into six groups.

Group 1 is made up of cases in which there was a long history, extending over months or years, of gradually increasing intestinal symptoms ultimately amounting to chronic obstruction, or terminating more abruptly in subacute or acute obstruction. It comprised 28 cases, in 11 of which the symptoms terminated in an acute attack, and in one in a subacute attack. In the remaining 16, the symptoms were those of gradually increasing constipation, but without any acute or subacute attack.

In *Group* 2 there was a history of repeated attacks of acute or subacute obstruction with intervening periods of almost complete freedom from symptoms, or at the most only constipation. There were 29 cases in this group; in all but two there was a history of two or more acute or subacute attacks.

Group 3 is a combination of the two preceding groups; there was an early history of months or years of gradually increasing constipation, followed by a period in which there were repeated attacks of acute or subacute obstruction ultimately demanding medical aid. This group comprised 12 cases.

Group 4 comprised 16 cases in which genito-urinary symptoms dominated the clinical picture, and it was mainly on account of this that the patients sought advice. In 14 cases in the group, examination revealed a vesico-sigmoidal fistula. In 11 of the cases there was a history of bowel trouble previous to the onset of the genito-urinary symptoms. In three of the cases of vesico-sigmoidal fistula there was no history of preceding bowel trouble.

Group 5 comprised eight cases in which malignant disease was associated with diverticulitis in the sigmoid. This figure must not be taken as reflecting the frequency with which malignant neoplasm and diverticulitis are associated; it is simply a series of cases in which pathological specimens were available. Clinically, this series divided itself into two subgroups, in the first of which there was a definite history of diverticulitis going back a year or two, and in the second the diverticulitis was mild or latent, and the symptoms were suggestive of carcinoma from the outset.

Group 6 comprised seven cases which could *not* strictly be placed in any of the other groups because of atypical features. Either there was no history of constipation, or diarrhœa was a feature. In one case constipation and diarrhœa alternated. Pain might, or might not, be present, but there was a *tumour* in the left lower quadrant. In view of the fact that constipation and obstruction have been emphasised as being the natural consequence of diverticulitis, this small group of atypical cases demonstrates that there may be exceptions in which the ordinary clinical manifestations of the disease are absent.

Clinical Features of the Acute Attack of Diverticulitis (Groups 1, 2, and 3).

The cases in these three groups, about 70 per cent. of the total, were characterised by constipation and one or more acute attacks, possessing certain distinctive features which constitute a syndrome of the lower left quadrant almost pathognomonic for diverticulitis.

An attack is usually preceded for a few days by a slight increase in the degree of constipation, slight bloating in the upper abdomen with belching, and often mild rolling gas pains in the lower abdomen of momentary duration. The onset of the acute stage is often precipitated by some form of purge, or by ingestion of rough or irritating food such as fruits or vegetables. Occasionally it appears to follow exertion or straining at stool. Severe colicky pain sets in, usually in the left lower quadrant. Sometimes at the outset the pain is generalised throughout the abdomen or distributed equally through both lower quadrants, but as a rule it finally settles down in the left lower quadrant, and if it is present in both lower quadrants it is always more pronounced on the left.

The *pain* is variously described as sharp, cutting, griping, or shooting, and may remain strictly localised to the left iliac fossa or may radiate over the crest of the ilium into the left side of the back, into the left groin and testicle, or, as in one instance, into the left knee. Radiation into both testicles was observed in one case in which the pain was present in both lower quadrants. The pain is often severe enough to double the patient up; at other times he will bend over and press on the stomach for relief. This, however, is only at the outset, for if there is peritoneal involvement he finds greater comfort in complete rest. It is often severe enough to require morphine.

There is sometimes an initial chill, and then the temperature rises to 100°F. or higher. In 30 of the cases in which fever was present with acute attacks, it varied between 100° and 102°. Nausea is not infrequently present, and more rarely vomiting. Usually, however, as with appendicitis, the patient vomits once or twice only. The bowels remain obstinately constipated, no flatus is passed, and enemas administered for relief often return clear. Urinary symptoms are common. In 41 of the 100 cases examined there were symptoms referable to irritation of the bladder. Excluding for the moment the 14 cases of vesico-sigmoidal fistula which will be considered later, there still remained 27 cases in which the relationship of the acutely inflamed sigmoid to the bladder produced difficulty or inability to start the stream, urgency, frequency, nocturia, and burning pain sometimes at the beginning and sometimes at the end of micturition. In fact, some degree of vesical tenesmus is typical during an acute attack of diverticulitis. The patient frequently observes that, apart from urinary symptoms, pain is relieved when the bladder is empty.

On examination there is generalised abdominal distension, or localised fullness in the left lower quadrant. On palpation, the left iliac fossa is tender, but muscular rigidity, if present, is usually very slight. In the left iliac fossa an elongated tender tumour in the position of the sigmoid can usually be palpated. This tumour was present in 56 per cent. of the cases of surgical diverticulitis.

On account of the associated obesity, abdominal distension, and tenderness, this palpable mass in the left iliac fossa is usually best felt by the rectum or bimanually. It varies in size and shape from that of a hen's egg to that of an orange or lemon. It is smooth, partially fixed, and usually very tender. In consistency it is firm, rarely hard, and occasionally it has been mistaken for an abscess. Because of the mobile nature of the sigmoid and its tendency to form adhesions, the position of the mass, although almost invariably in the left lower quadrant, may vary somewhat. It may be accessible to the examining finger by rectum, or it may be high and far out in the left iliac fossa. Sometimes it is close in toward the median line, and may be palpated between the bladder and rectum. The most distinctive feature about the sigmoid tumour is its tendency to appear during the acute febrile period and to disappear in the intermission. The disappearance may not be complete, but there is always marked recession in size after the acute attack has passed. In some instances the patient has been the first to notice the tumour, and has not only seen the fluctuations in size during the acute attacks, but has also affirmed that the mass was larger during the present attack than during a preceding one.

An acute attack of diverticulitis may last from a few hours to two or three days. Occasionally it is prolonged for a week or more, or until relieved by operation. Defæcation usually gives marked relief, although it may be attended by considerable pain, and enemas, if persevered with, will usually relieve most of the discomfort. Occasionally slight diarrhœa may set in for a day or two, or an excessive amount of mucus may be passed. Pari passu with the relief of the abdominal distension the mass in the left lower quadrant becomes smaller and less tender, and may disappear entirely. During the acute period, from 10,000 to 20,000 leucocytes is a common finding. While it is true that in a considerable proportion of cases attacks of acute diverticulitis will abate if left alone, occasionally the obstructive symptoms are so alarming as to call for operation. In seven cases in the present series colostomy had been performed before examination at the Mayo Clinic.

Symptoms of Fistula (*Group* 4).—The symptoms referable to the development of fistula were either preceded by symptoms suggestive of a flare-up in the bowel condition or developed suddenly without any such warning. Often there was increasing constipation and intermittent pain in the left lower quadrant for a week or more. Impending perforation into the bladder was heralded by pain and tenderness immediately over the vesical area. Sometimes, however, dull and boring perineal pain was experienced for several days, and a degree or two of temperature was invariably present. Then an attack of urgent, burning, and painful micturition was accompanied by the passage of small grape-seed-like fæcal particles through the urethra and also audible gas at the end of micturition. The patient usually noticed that the urine was heavily loaded with sediment and had a fæcal odour. The passage of gas and fæces by urethra usually relieved the acute pain, but cystitis remained, resulting in urgency, frequency, and nocturia. These symptoms persisted intermittently, with occasional flaring-up of the cystitis, until relieved by operation.

Differential Diagnosis of Carcinoma (*Group* 5).—The clinical distinction between diverticulitis and carcinoma may be difficult. In fact, if carcinoma develops in a colon where there is diverticulitis, the differentiation may be well-nigh impossible, except by the pathologist, until the malignant process is advanced. Cramping pain in the left lower quadrant was usually present, but frequently burning and pain in the rectum was also complained of, and painful defæcation and tenesmus were associated features. It is true that in uncomplicated cases of diverticulitis tenesmus may occur, but it is rare, and though painful defæcation may immediately follow an acute attack, it is not present at other times. Pain and burning in the rectum are rarely met with in diverticulitis. Bleeding from the bowel is suggestive of carcinoma; it is rare in diverticulitis and, if it occurs, search ought to be made for hæmorrhoids, which are usually present as a result of the constipation. Mucus may be passed in both diverticulitis and carcinoma, but it is much commoner in the latter and is usually streaked with blood. In malignant disease pain, if present, may go through to the back, a very infrequent radiation in diverticulitis. There is usually loss of weight in both conditions. The barium enema may demonstrate a filling defect only. The sigmoidoscope will usually reveal carcinoma if the tumour is accessible, but it is rarely possible to diagnose diverticulitis in this manner.

TREATMENT.

Uncomplicated diverticula of the colon require no special treatment beyond controlling the constipation by appropriate measures which keep the diverticula of the sigmoid free, so far as possible, from the formation of hard concretions which are the precursors of inflammatory changes.

Even when inflammatory changes have taken place, the tendency is towards increasing conservatism in treatment; radical operations, implying extirpation of the affected portion of the intestine, are not to be undertaken lightly. Medical management, in a proportion of cases, not only tides the patient over an acute attack, but may even safeguard him against subsequent attacks. In severer cases, however, and when obstructive symptoms are urgent, surgical intervention may be necessary; the choice lies between colostomy, with the possibility of resection later, or resection without preliminary colostomy. The resection may take the form either of a Mikulicz operation, or an anterior tube resection of the Balfour type. In the present series, a Mikulicz resection was performed in 42 cases; in 21 an anterior tube resection was performed by the Balfour method, either with or without preliminary colostomy; in eight colostomy alone was performed. The surgical procedures carried out in the remaining cases included local excision of diverticula, resection of a portion of the circumference of the intestine, plastic closure of vesico-sigmoidal fistulæ, and short-circuiting operations to relieve obstruction.

There was a mortality of 10 per cent. Most of the remaining patients, traced for years, were relieved, but a few still had some constipation which, however, was readily controlled by paraffin.

(*Bibliography at foot of next page.*)

THE TREATMENT OF DIPHTHERIA CARRIERS.

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THE carriers from all the Metropolitan Asylums Board Infectious Diseases Hospitals were collected together in the North-Eastern Hospital and made the subject of an extensive investigation, of which the primary object was to discover why some patients should continue to harbour diphtheria bacilli for prolonged periods after convalescence from an attack of clinical diphtheria. This part of the investigation took a considerable time to complete, and the findings obtained therefrom have been published by Thomson, Mann, McCartney, and Harvey[1] in the Annual Report of the Metropolitan Asylums Board for 1926–27. The presence of pathological conditions or physical abnormalities in the nose, nasopharynx, or throat was found to be the main predisposing factor in inducing or sustaining the carrier state. It also appeared that the diphtheria bacilli were living an extra-corporeal or saprophytic existence in the inflammatory products present along with these abnormalities, and were *not* existing actually in living tissues. It followed from this that the correction of such abnormalities as enlarged turbinates, deflected septa, with crusting of the nasal mucosa and nasal discharge, and septic and ragged tonsils, ought to go a long way towards curing the carrier condition. The methods of treatment used in the investigation had therefore this object in view. The cases were all "chronic carriers," that is, people who had harboured true virulent diphtheria bacilli for a period of at least 12 weeks. This definition of a carrier, though arbitrary, was important, since it implied that the infection was not merely a transient one.

Criterion of Cure.

It was the practice at the North-Eastern Hospital to take cultures from each patient once a week, and only to regard a carrier as free from infection when six consecutive negative cultures were obtained. Very many cases, after yielding negative cultures for three, four, or even five weeks, became positive once more and remained so for prolonged periods. It is always wise to have the cultures taken by someone competent to do so, preferably the person who is to examine them. Thus at the North-Eastern Hospital all the carriers were cultured personally and were not regarded as "free from infection" until six weekly negative cultures had been obtained.

The Throat Carrier.

The carrier with bacilli in the throat only does not appear to present any difficulties of treatment. *Removal of the tonsils as first advocated by Pegler,*[2] *or of the tonsils and adenoids, gives very satisfactory results.*

At the North-Eastern Hospital 60 cases were treated by the removal of tonsils and adenoids, the operations being performed by Mr. Humphrey Marriner. Of these 60 cases 17 harboured bacilli in the throat only, and of the 17 cases 16 were cured. The remaining 43 cases had bacilli in the nose or ear as well as in the throat, and of these 19 were cured. It was noted that the percentage of "cures" decreased in direct proportion to the extent to which the nose cultures were positive. Nine patients who were operated upon because of large and unhealthy tonsils and of intermittently positive cultures showed the Klebs-Löffler bacilli in the crypts of the tonsils removed at operation, although the preceding cultures had been negative. Four nurses who harboured diphtheria bacilli in the throat had their tonsils removed before the end of the 12 weeks period which would have made them officially chronic carriers. In each case a cure resulted.

It will thus be seen that if the bacilli are confined to the throat the likelihood of a cure from removal of the tonsils and adenoids is great. The optimum time for the operation seems to be earlier than is usually advised. *If the throat cultures remain persistently positive, and if the tonsils show any evidence of being the site of an inflammatory process, they should be removed six to eight weeks after the onset of the infection.* The tonsils removed at operation were examined culturally and by section for the presence of diphtheria bacilli, which were present in the tonsils and adenoids in 61 per cent. of cases. It was evident that the tonsil likely to harbour diphtheria bacilli was not the large, clean tonsil, but the small, ragged, septic one with deep crypts. It was usually possible to foretell by clinical examination the tonsil which, on removal, would yield diphtheria bacilli on culture. In 1917 H. Stévenin,[3] and in 1921 G. H. Weaver,[4] drew attention to the fact that an attack of follicular tonsillitis in a carrier freed the carrier from infection. A. Schiotz,[5] in 1919, suggested that this observation might be applied practically by spraying the throat with living staphylococci and thus inducing an attack of tonsillitis. This method has not been tried during the present investigation, but several of the carriers in this series contracted severe tonsillitis and, although the Klebs-Löffler bacillus disappeared temporarily from the throat, it invariably returned when the acute stage of the tonsillitis had subsided.

The Nose Carrier.

Nasal carriers of diphtheria are very refractory. A constant feature is the presence of rhinitis, which may take the form of a watery or purulent discharge, or of extensive crusting round the anterior nares, sufficient in some cases to obstruct the breathing. The great majority of chronic carriers have diphtheria bacilli in the nose. Various methods of treatment have been suggested from time to time, but none has

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proved completely efficient. Local application of antiseptics to the mucous membrane has never been accepted as a completely satisfactory means of treatment. Vaccines have been used by various workers,[6 7 8 9] who claim more or less satisfactory results.

At the North-Eastern Fever Hospital 38 chronic and persistently positive carriers were treated by vaccines of the organisms, other than diphtheria bacilli, present in the nose. Only in three cases were the vaccines composed solely of Klebs-Löffler bacilli. They were all autogenous. The abnormal condition of the nose was ascribed to the presence of pyogenic organisms, rather than to the diphtheria bacillus, and it was therefore hoped that, if the former were removed by autogenous vaccines, the condition of the nose would improve and the diphtheria bacilli would no longer obtain a pabulum for growth. The organisms included staphylococci (albus and aureus), pneumococci, and hæmolytic streptococci. The results were only moderately satisfactory. Of the 38 cases treated 16 cleared up after one to nine weeks. The remaining 22 cases remained positive, although some of them improved. Material from the noses of the carriers treated was inoculated on to blood-agar plates, and it was found that all the organisms from which the vaccines had been prepared had disappeared from the noses, except the staphylococci. In view of this fact a further course of treatment was sought which might be effective in clearing the ubiquitous staphylococcus from the nasal passages. This treatment took the form of a mildly alkaline nasal douche, made up as follows: sodium bicarbonate, sodium chloride, sodium biborate, aa. ʒij. to water ℥xx., i.e., about 2 grains of each per oz. of water. This stock solution was diluted for use with equal parts of warm water, and the noses were douched night and morning, the solution being allowed to run into the nose and out of the mouth by gravity. In some cases a small quantity of hydrogen peroxide (about one drachm per pint) was added to the solution to soften crusts around the nares.

The results of nasal douching were very satisfactory. Crusting and rhinitis were greatly lessened, and nasal discharge usually diminished or ceased altogether. The nasal mucous membrane became pink and healthy and altogether the condition of the nose was greatly improved. Material from the noses of the carriers thus treated was inoculated as before on to blood-agar plates, and the noses which before treatment had yielded an abundant flora were now found to be practically sterile. Moreover, although the former flora usually returned almost immediately when the douching was discontinued, the diphtheria bacilli did not do so in a large proportion of the cases.

In all 62 cases were treated. In 7 treatment had to be stopped owing to the refractory behaviour of the children. Of the remaining 55 cases 27 cleared up in from one to seven weeks. Eight cases cleared up after one relapse, and a further 8 cases cleared up after a second course of treatment. The treatment had no effect in 12 cases. Most of the children behaved quite well when being douched, and those who showed any nervousness quietened down after a short time. This form of treatment is inexpensive and easily carried out. The procedure adopted was to continue the douching until three negative cultures had been obtained at weekly intervals. Douching was then discontinued, and the carrier was discharged after a further three negative cultures, taken at weekly intervals. Thus any doubt that the negative cultures might have been due to the douching was removed. The youngest child treated was 8 months old. The complete results were :—

		Per cent.
Total cases treated	62	
Cases in which treatment had to be stopped	7	
Actual cases treated	55	
Cases cured after one course of treatment ..	27	= 49
" two courses " ..	8	= 14·5
" one relapse	8	= 14·5
Total number of cures	43	= 78
Total number of failures	12	= 22

The results obtained from douching were even better than they appear, since the carriers chosen for treatment were mostly cases who were persistently and strongly positive and who had failed to clear up after undergoing various other forms of treatment.

A method of spraying the nose with an alkaline spray was tried, but the results were unsatisfactory.

A small series of cases was treated by autogenous vaccines, together with daily nasal douching. The results in 9 cases were that 3 cleared up immediately treatment was commenced; 3 ceased to carry virulent Klebs-Löffler bacilli, but were found to be harbouring non-virulent organisms; 1 cleared up after two vaccines; and 1 failed to clear up.

A 1 per cent. solution of iodine oil was applied to the noses of four carriers. Of these three cleared up, while the other failed to do so. There was some evidence, however, that the cases were clearing up before treatment commenced, and as this form of treatment had previously been found of no avail, it was not continued.

Antrum and Adenoid Investigation.

When cases fail to clear up after vaccines and nasal douching, the antrum of Highmore was suspected as the source of the bacilli. The antrum was opened and explored in three cases. Diphtheria bacilli were isolated from it in two cases, under circumstances which excluded contamination, while in the third case the examination revealed no growth. The antrum was thoroughly cleaned out in one of the patients, and the case cleared up with the help of nasal douching. It is usually very difficult to operate upon the antra of a young child, and permission may be refused. X ray photographs are of little, if any, help. The antrum, however, should be kept in mind as a last resort in the investigation of very persistent nose carriers.

Sixteen carriers were operated upon, principally to see the effect of the removal of the adenoids upon the carrier state. In no case, however, were the adenoids removed without the tonsils, as the latter always showed sufficient evidence of abnormality or definite disease to warrant their removal. All cases chosen had strongly positive nose cultures; three of them were cured, and diphtheria bacilli were isolated from the adenoids in two of these. Removal of the adenoids does not seem to be effective in the treatment of nose carriers.

The Ear Carrier.

The treatment of ear carriers is extremely difficult. No satisfactory form of treatment was discovered. The discharge often ceased altogether for several weeks and then, without any apparent cause, began again. The commonest method of treatment was to instil hydrogen peroxide and alcohol drops into the ear. Cases were treated by vaccines, removal of tonsils and adenoids, mastoidectomy, and nasal douching. The results were as follows :—

	Cures.	No effect.	Total.
Removal of tonsils and adenoids ..	3	3	6
Vaccines (consisting of organisms isolated from the nose) ..	2	1	3
Nasal douching	3	1	4
Mastoidectomy	1	1	2
			15

Many so-called "carriers" were admitted to the North-Eastern Hospital on suspicion of harbouring diphtheria bacilli in the ear, but the bacilli were really saccharose-fermenting diphtheroids, and not true virulent Klebs-Löffler bacilli. Since these carriers are so intractable it is fortunate that the presence of virulent diphtheria bacilli in discharge from the ear is uncommon.

Results of Various Forms of Treatment.

Form of treatment.	No. of cases treated.	No. (and per cent.) of *immediate* cures.	No. (and per cent.) of *delayed* cures.*	Total No. (and per cent.) of cures.	No. (and per cent.) of failures.
Vaccines	38	10 (26·4)	6 (15·7)	16 (42·1)	22 (57·9)
Nasal douching ..	55	23 (41·8)	20 (36·2)	43 (78)	12 (22·2)
Vaccines and nasal douching combined	7	3 (42·9)	1 (14·2)	4 (57·1)	3 (42·9)
Removal of tonsils and adenoids ..	60	33 (55)	2 (3·3)	35 (58·3)	25 (41·7)

* Over three weeks and including relapses and cases in which a second course of treatment was necessary.

It should be noted that the cases chosen for treatment were the most persistent and chronic carriers obtainabl

In addition to the specific methods general hygienic methods were always adopted in an endeavour to improve the health of the carriers. It was found, however, that the general health was usually extremely good, and this factor seems to have little if anything to do with the duration of the carrier condition. Exposure to carbon arc radiation was tried, but appeared to have little effect.

Conclusions.

1. The most important carrier is the one who harbours diphtheria bacilli in the nose.

2. The only satisfactory form of treatment for the nose carrier tried during the investigation was douching with a mildly alkaline nasal douche. Properly carried out this yields excellent results.

3. Tonsillectomy yields very satisfactory results in carriers whose bacilli are confined to the throat.

4. The ear carrier, happily uncommon, is very difficult indeed to deal with, and does not respond readily to treatment.

5. The treatment of diphtheria carriers should mainly consist in rectifying local abnormalities and pathological conditions responsible for the carrier state. If this is done properly the coexistent abundant flora will be diminished, and the diphtheria bacillus will probably disappear also.

6. Diphtheria carriers should be treated as early during convalescence as is compatible with safety, always bearing in mind the likelihood of diphtheria complications. The longer the bacilli are allowed to remain in the infected area the more difficult does their removal become. In addition, apart from the loss of education to the children, the burdens which diphtheria carriers lay upon the finances of the various public health bodies make the necessity for their early treatment and cure a very important consideration.

I wish to thank Dr. F. H. Thomson, medical superintendent of the North-Eastern Hospital, and Dr. J. E. McCartney, director of research and pathological services to the Metropolitan Asylums Board, for their unfailing courtesy and assistance throughout the investigation.

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CARDIAC INFARCTION WITHOUT PAIN.

A SERIES OF EIGHT CASES.

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ALTHOUGH the syndrome of cardiac infarction with prolonged anginal pain is now well recognised, few cases have been recorded of infarction without pain. We have recently seen seven cases where the patient was able to refer the beginning of his illness to a particular day on account of the sudden onset of severe dyspnœa, but this was completely free from pain.

CASE 1.—A police sergeant, aged 57, enjoyed good health until February, 1926, when he suffered from an attack of "influenza" characterised by dyspnœa and giddiness. He recovered completely from this and, save for a slight degree of shortness of breath when bicycling, his health remained perfectly normal during the rest of the year. On June 29th, 1927, he "caught a cold," and was confined to bed on account of great dyspnœa and a severe cough. He recovered rapidly, but the dyspnœa persisted and became more troublesome, so that he experienced considerable difficulty in walking even on the level, and required four pillows for comfort at night. During the last three weeks he had noticed that he was passing less urine. He had not had any pain.

Examination on Jan. 17th, 1928, showed a large heavily built man who appeared distinctly pale. The pulse was 134 and regular. The arteries were not thick; blood pressure 140/90. The apex of the heart was in the sixth space and 1 inch external to the nipple. The impulse was moderately heaving in character. The first sound at the apex was short and was reduplicated from the nipple line to the sternum. There were no murmurs. There was no œdema; the liver was not enlarged, and the lung bases were clear. The urine contained no albumin. The Wassermann reaction of the blood serum was negative. The electrocardiogram showed a left-sided preponderance.

He was put to bed and given digitalis, ♏xx., four times daily for eight days, followed by ♏xxx. daily. During this period his pulse fell to 80, and his urine output increased from 20 oz. before treatment to an average of 40 oz. All trace of the reduplication disappeared. On Feb. 10th he died suddenly in bed.

Post-mortem Examination.—The right side of the heart was engorged with blood, but appeared healthy. All the valves were normal. The cavity of the left ventricle was considerably reduced by the presence of ante-mortem clot, which was firmly adherent to the cardiac wall. This clot was distributed in two irregular areas, the first and larger of which involved the apex, while the second started posteriorly in the region of the papillæ of the mitral valve, and traversed the ventricle horizontally, ending near the interventricular septum. Corresponding to this distribution of the clot there was extensive disease of the muscular wall. At the apex it was almost wholly replaced by dense white fibrous tissue, so that only a thin strip remained on the pericardial surface. In the second area fibrosis was not so advanced, but was evident as a belt encircling the ventricle. Histological section showed that the clot was firmly organised to a thickened endocardium. The proximal 2 inches of both coronary arteries were thickened, atheromatous, and partly calcareous. The left contained a strip of active ulceration and destruction of the intima. There was complete occlusion of the following vessels: (1) a large branch of the left coronary, descending in the anterior interventricular sulcus to the apex, and a small branch of this supplying an area in the region of the interventricular septum; (2) two large branches of the right coronary, from a clot lodged at their bifurcation, supplying the posterior wall of the ventricle and extending round to the anterior surface as far as the interventricular septum. This was an abnormal distribution, since this area is usually supplied by the circumflex branch of the left coronary. Sections of the four occluded arteries showed a trace of lumen in each. In two of these multiple channels could be seen. The cellular structure of the tissues occluding the vessels suggested organised clot rather than inflammatory endarteritis, so that it appeared as if partial recanalisation had occurred (Fig. 1).

CASE 2.—A male, aged 51, a patient of Dr. Williamson, had enjoyed good health until December, 1927, when he "caught a cold" after a strenuous day. For this he had to go to bed for a few days as he was so short of breath; and during this time his ankles were swollen and he had a troublesome cough. He recovered rapidly, but his dyspnœa persisted so that he has not felt quite right since. On Feb. 7th he spent the day motoring, and caught a further "cold," which kept him in bed till the time of examination. He had the same symptoms as before, with the addition of some tightness at the lower end of the sternum, which he attributed to coughing.

Examination on Feb. 17th, 1928, showed a large man who appeared rather pale. His arteries were only moderately thickened; blood pressure 160/110. The pulse was 100 and irregular from frequent extrasystoles. The apex of the heart was in the sixth space and external to the nipple, and the impulse was slapping in character. The second sound was reduplicated from the apex to the sternum. There were no murmurs. Œdema was present over both ankles, and crepitations could be heard at both bases. A polygram (Fig. 3) showed a low-tension pulse with a moderately persisting alternation, and ventricular extrasystoles.

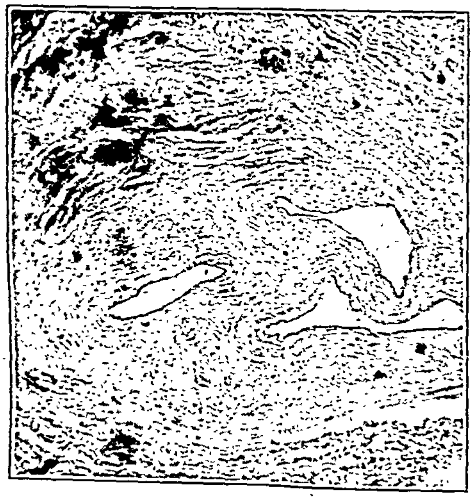
Ten days later he had symptoms of infarction in the lungs, with pain in the right side of the chest and hæmoptysis. He recovered from this, and is now free from all signs of heart failure.

Although post-mortem evidence of infarction is lacking, his condition was so exactly comparable to the other cases that it can hardly be doubted that he has one or probably two infarcts in his myocardium.

CASE 3.—A man, aged 54, a patient of Dr. Hinsley Walker. Four years ago, after rapidly mounting two flights of stairs to his room, he grasped the bed rail and fell on his back with his "face working." A doctor pronounced the condition to be a faint and kept him in bed the next day. Since that time he has been in good health, but he noticed he could not manage the long walks he used to take, as he became short of breath. During the last six months he has had a cough and some nocturnal attacks of dyspnœa, with tightness round the lower part of the chest. Deep cyanosis had been noticed when he was turned on his left side to reduce prolapsed hæmorrhoids.

Examination on Feb. 28th, 1928, showed a big man whose face was cyanosed. His pulse was 120, and his blood pressure was 160/110, but these readings must be discounted to a certain extent, since the patient was apprehensive. The radial artery was impalpable. The apex of the heart was half an inch outside the nipple line. The first sound at the apex was replaced by a systolic murmur which was conducted out to the axilla. The second sound and the sounds at the base were normal. The lungs were normal except for a few rhonchi posteriorly. The liver was not palpable and there was no œdema.

FIG. 1 (Case 1).



Section of terminal anterior branch of left coronary artery, showing recanalisation in granulation tissue of organised thrombus.

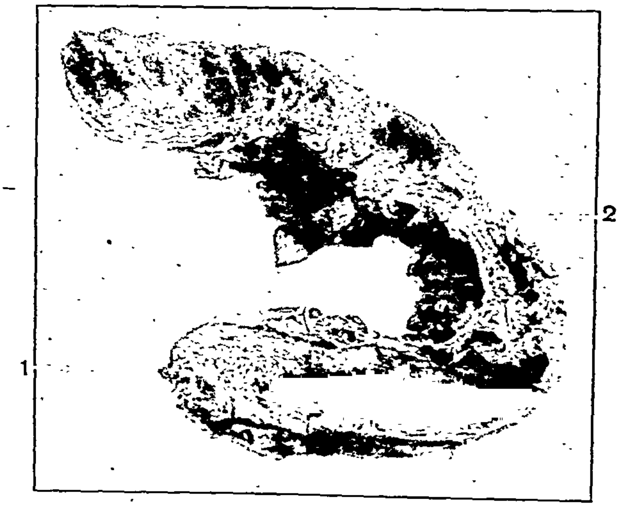
A fortnight later he had a hæmoptysis and became feverish. Three days after he died suddenly.

Post-mortem Examination.—Both auricles and the left ventricle of the heart were much enlarged. There was no valvular disease, but the mitral orifice was greatly dilated. The anterior surface of the left ventricle near the apex was firmly adherent to the pericardium by a dense fibrous strand with an area of attachment of about 1¼ inches in diameter. This area formed the apex of a spherical aneurysm of the ventricle approximately 2 inches in diameter. The wall of the aneurysm was thin and calcareous, and contained little muscular tissue. The lining endocardium was yellow, thickened, calcareous, and partly ruptured by ulceration. The left coronary was in a condition of advanced atheroma throughout its course, with ulceration and calcification. The main branch, descending along the anterior interventricular sulcus, was completely obliterated by old organised tissue. The terminal portion of this branch was patent but collapsed. The right coronary was normal except for some ulcerative atheroma in its proximal portion. At the apex of the left lung there was a necrotic area where the lung was firm and solid. On section all this area was seen to be involved in an acute necrosis which was breaking down into pus. The main branch of the pulmonary artery supplying the apical region was plugged with a thrombus for about one inch, and the thrombus had extended into the branch supplying the remainder of the upper lobe where the lung had a normal appearance. There was a bilateral pleural effusion, some ascites, and a nutmeg liver.

The patient appeared to have had two pulmonary infarcts. The first caused the hæmoptysis and the lung abscess, while the second was followed by sudden death.

CASE 4.—A man of 63 was in good health until July, 1926, when he had a sudden and severe attack of dyspnœa, which obliged him to keep to his bed for two months. He recovered to a certain extent, but could never go back to his work, and a year later he was admitted to King's College Hospital. He had not had any pain.

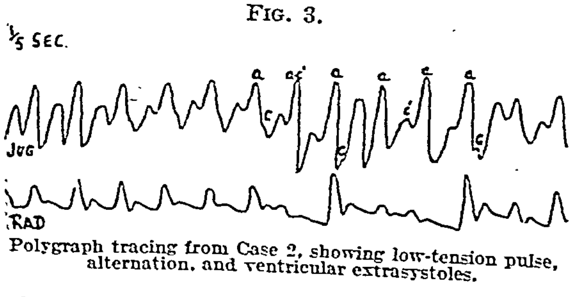
FIG. 2 (Case 1).



Slice of left ventricle in lateral plane, showing two main areas of fibrosis: (1) apex; (2) middle transverse zone cut at two points.

On examination he was slightly cyanosed and the legs and lower part of the body were swollen. The pulse was irregular from extrasystoles. The blood pressure was 162/116, and the radial artery was thick. The apex-beat was almost imperceptible, but the heart appeared to be enlarged in both directions. The first sound at the apex was reduplicated, and there were soft systolic murmurs in the mitral and tricuspid areas. The liver was large and tender. The urine contained albumin, and the blood-urea was high, 145 mg. per 100 c.cm. The electrocardiogram showed a left-sided preponderance with an inverted T wave in lead I, and a flattened T in lead II. The P.R. interval was increased to 0·24 of a second. Extrasystoles were present, arising from the right ventricle and from an intermediate focus near the septum. For a time he improved under treatment, but later heart failure supervened, and he died 15 months after his initial attack.

FIG. 3.



Polygraph tracing from Case 2, showing low-tension pulse, alternation, and ventricular extrasystoles.

Post-mortem Examination.—The heart was very large; on the anterior aspect of the left ventricle near the apex the pericardium was adherent to the chest wall. Corresponding to this was an area of fibrosis in the ventricle where the muscular wall was thin. This extended into the adjacent part of the right ventricle and into the lower and anterior part of the septum, and was continuous with a mural thrombus which was firmly attached to it. Inside the right ventricle was a recent thrombus, and there were some infarcts in the lungs. The anterior descending branch of the left coronary artery was in a state of advanced atheroma, but the main channel seemed to be patent as though it were recanalised. Microscopical section of the infarct showed that the muscle was replaced by fibrous tissue and that the small arterioles were obliterated by overgrowth of their intimal coats.

CASE 5.—A man, aged 52, had a sudden and severe attack of shortness of breath in September, 1926. He had previously enjoyed good health. This dyspnœa affected him apart from exertion, and he was completely incapacitated. At the same time a troublesome cough developed, and he experienced paroxysmal attacks which he called asthma. After about a month he recovered sufficiently to be able to work a little in a warehouse. He soon had to give up, however, and came into hospital. At no time had he had any pain in the chest.

On admission he was orthopnœic and pale, with a little cyanosis. The pulse was irregular from frequent extra systoles, the radial was moderately thick, and the blood pressure 140/90. The heart was considerably enlarged, and the apex beat was wavy. There was reduplication of the first sound at the apex, and an apical systolic murmur. The jugular veins were full, the liver was large and tender, and the ankles were swollen. The electrocardiogram showed left bundle branch block with premature beats arising in the left ventricle. The Wassermann reaction was negative.

During two months in hospital on digitalis and diuretin he improved considerably. Heart failure recurred, however, and he died suddenly in hospital 11 months after his original attack.

Post-mortem Examination.—The heart weighed 750 g. All the chambers were dilated and the walls of the ventricles were abnormally thick. Under the posterior flap of the mitral valve the endocardium was thickened, and the trabeculæ were thin and atrophic. The posterior papillary muscles were wasted. Fibrous tissue replaced the muscle for a depth of 2 mm. This area of fibrosis involved the upper part of the posterior wall of the left ventricle and extended forwards into the posterior part of the interventricular septum so that it encroached upon the left branch of the bundle of His. The coronary arteries were calcified in places, the circumflex branch of the left coronary and the posterior part of the right being the most severely affected. Both arteries, however, had their main channels patent. There was a patch of thickened pericardium over the area of infarction at the back of the left ventricle.

CASE 6.—A man, aged 41, had an attack of breathlessness when walking in the street. He was quite overcome and had to keep to his bed after it for some days. After a little he recovered fairly well and was able to get about again. Then gradually the breathlessness on the least exertion came back. When seen he was obviously far gone in heart failure. The condition was in striking contrast to his appearance eight months before, when he had been successfully treated for gastric ulcer. The heart was greatly enlarged, with a wavy, heaving apex-beat. A clear gallop rhythm, due to reduplication of the mitral first sound, could be heard at the apex. There was severe venous engorgement. Under treatment with large doses of digitalis he got rather better and insisted on leaving hospital. In a month he was back with thrombosis of the right subclavian and jugular veins, and his heart was worse than ever. On this occasion it was possible to take an electrocardiogram. This showed small complexes in all leads, absence of the T wave in the first lead, with very small indefinite T waves in the other two. Frequent extrasystoles came from several foci in both ventricles.

The Wassermann reaction was negative.

The diagnosis was thrombosis of the coronary arteries and myocardial infarction.

He gradually got worse and died, about six months after the onset of the symptoms.

Post mortem there was a very large heart with a patch of thickening of the pericardium over the left ventricle in front. Here the wall was very thin, and on opening the chamber a large area of infarction was revealed. This involved most of the front of the left surface of the interventricular septum and a good deal of the front of the left ventricle itself. The descending branch of the left coronary artery was blocked by an old thrombus just at its origin. At this point there was a small atheromatous patch. The obstruction was not more than a centimetre long, and obviously canalised, as it was easy to demonstrate that blood could be squeezed through small holes in the obstruction. Elsewhere there was very little atheroma. The changes of chronic venous engorgement were intense. The right subclavian and innominate veins were thrombosed, and there were sundry infarcts in the lungs.

CASE 7.—A professional man of 68 was walking in his garden when a sudden shortness of breath overcame him, so that he collapsed and seemed for the time as though dying. Before this he had been active and had played golf a good deal, doing rather more than usual for his age. After the attack he could not leave his bed. The dyspnœa continued so that he had to keep sitting up, and was really most comfortable in a chair. When seen a fortnight after the attack he looked blue, the legs were swollen, and the liver large. The heart beat at 84, with many extrasystoles. The radial was rather tortuous, the blood pressure 125/70. Over the heart, which was a good deal enlarged to the left, the mitral first sound was faint, and then reduplicated, so that a gallop rhythm was heard. Under fairly large doses of digitalis and diuretin he made progress and is now a good deal better.

There can be little doubt that in this case myocardial infarction led to this sudden and severe failure of the heart, the chief symptom of which was dyspnœa, without anginal pain at any time.

CASE 8.—A business mar [illegible] and retired to bed. When [illegible] sat up with a cry, and fel [illegible] not been looking well for some months, and for the last five months had complained of getting tired very easily. Every day he had walked up a considerable hill on his return from business. Angina he had never had, neither was he troubled with dyspnœa to any degree. He had not consulted a doctor for five years.

Post mortem there was an area of infarction in the upper part of the front of the left ventricle. It was old and well organised, and had evidently been there for months. Thrombosis had occurred in the descending branch of the left coronary artery, but small canaliculi were easily seen in the obstruction where the thrombus had been. The heart was very large, 26 oz., with dilated capacious chambers. In the aorta there was much soft atheroma, the radial was thick and tortuous, and the kidneys rather granular. It is probable that he had high blood pressure. The striking point here is the negative history, there being neither angina nor dyspnœa coming in an attack, nor the gradual onset of heart failure. Yet the lesion was a large one, of some considerable standing.

Discussion.

Parkinson and Bedford,[1] in their account of cardiac infarction, include a type with dyspnœa and failure but without pain, which may be found when infarction supervenes in a patient with pre-existing signs and symptoms of heart failure. Two out of their 100 cases were of this type. Gibson,[2] out of 43 cases verified by post-mortem examination collected from the literature, has a group of six patients with chronic heart failure in whom dyspnœa was a prominent symptom. J. Cowan, quoted by Gibson, referred to two cases in which there was a sudden onset of dyspnœa, but in one there was a coexisting parenchymatous nephritis, while the other subsequently developed pain. Coombs[3] had a case in which there was a sudden onset thought to be due to influenza, and death occurred in three months from heart failure. Wearn,[4] on the other hand, found dyspnœa to be prominent in 16 out of the 19 cases of infarction studied by him. It was the predominant sign and chief complaint in four of these patients who had no previous signs of cardiac failure, and was so severe that it was out of proportion to the other findings in the heart and lungs.

Six of our cases are clinically very similar. They all had a sudden attack of severe dyspnœa associated with heart failure. Recovery from this illness took place to a greater or lesser extent, but in no case was the patient ever the same as he was before the attack. In three the recovery was rapid and fairly complete; in the others it was the prelude only to a slowly progressive and fatal heart failure. The physical signs were such as have been described after cardiac infarction accompanied by pain. There was enlargement of the heart to the left, and a form of gallop rhythm at the apex. Five cases had frequent extrasystoles. In three instances the electrocardiogram showed that they were arising from the region of the heart in which the infarct was subsequently found. In the third case the polygram demonstrated the presence of pulsus alternans. Case 3 was seen four years after the probable date of his initial attack, at a time when he was not suffering from any cardiac embarrassment; his death was not primarily due to heart failure.

It appears, therefore, that cardiac infarction may occur in an apparently healthy individual, entirely unaccompanied by pain. It should be suspected as the cause of an attack characterised by the sudden onset of severe dyspnœa with heart failure, when no other reason can be found. The signs of failure may disappear fairly soon, but some permanent disability is always left.

We are much indebted to Dr. F. B. Smith, pathologist to the Harrogate Infirmary, for the post-mortem notes of Cases 1 and 3, and for his care in preparing the photographs; and to Dr. Raymond Crawfurd for permission to include Case 4.

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RADIOLOGY AND SURGERY IN CANCER OF THE BREAST

AND IN "CHRONIC MASTITIS."

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ANALYSIS of 600 cases of breast cancer, treated with X rays or radium, and 60 cases of "chronic mastitis," treated with X rays, suggests that both in the prevention and cure of cancer of the breast radiological measures could be employed with advantage much more extensively than they are at present. Their use is almost entirely restricted now to practically hopeless patients with inoperable primary or recurrent disease, as it was for so long in cancer of the uterus, and there is little recognition of the unique effect of radiation (1) in rendering cases on the borderline of operability operable, (2) in sterilising the operation area so that so-called "recurrences" are less likely to take place, (3) in being a complete method in itself leading to cure in a proportion of early and even advanced stages of breast cancer, and (4) in its almost invariable success in the precancerous "chronic mastitis."

"Recurrence" and Preoperative Radiation.

If in all clinically early patients the malignant disease were localised in the breast substance, the percentage of surgical success would be 100 per cent. That the results as a whole are much poorer than this shows that in no given patient can the limitation to the breast be affirmed with absolute certainty. John Fraser has shown with whole-breast sections what widespread changes may occur with a small apparently early tumour: and for many patients we must fear, as Sir Lenthal Cheatle has said, that "when a lump appears in carcinoma the disease is well advanced."

When the second stage with palpable axillary nodes is reached, we may only reasonably expect from purely surgical intervention a 1 in 25 chance of saving life. Many sets of statistics support this conclusion of James Ewing. In these more advanced cases life may be prolonged for many years by surgical measures, but surgical statistics do not show what happens in the large proportion of interventions in which operation is incomplete. If the operation is gravely incomplete it may be followed by rapid widespread local or general recurrences within a few months, as I have seen in about ten patients who had had *no* radiation. It is such patients that suggest that there may be a "growth-restraint" exercised by the primary focus, the removal of which, with its possible growth-restraining hormones, leads to rapid new growth in the residue of cells. Alternatively these cases suggest that the knife, cutting across infected tissues and setting free live cancer cells, has stimulated their growth-activity—as incision is one of the best means of stimulating an animal tumour's growth (W. E. Gye). (Claude Regaud and James Heyman have shown in the tongue and cervix respectively that diagnostic incisions are contraindicated, as they make the end-results worse.)

In view of the large body of pathological and clinical evidence as to the partial or complete sterilising effect of radiation on malignant cells, a widespread preoperative use might well be made of X rays or radium to sterilise the operation field as far as is practicable. Very little advantage has, however, been taken of this means, which seems not far from ideal for the purpose. All that I have been able to find advanced in opposition to a general use of preoperative radiation is (1) that it is an uncertain and insufficient measure (F. C. Wood is against it because, on the basis of some animal experiments and contrary to a vast body of clinical experience, he asserts that a four or five skin-erythema dose is necessary to destroy breast cancer cells); (2) that its use delays the healing of the skin incision—N. S. Finzi has noted cases where this has happened; and (3) that radiation may stimulate the growth, as Sir Holburt Waring concludes from one case where a patchy redness and skin nodules appeared a fortnight after one X ray application. But the very existence of a stimulation dose is wholly denied by many radiologists of great experience (Guido Holzknecht, Heyman). A moderate surface application should not interfere with the healing of well-nourished skin-flaps, as has been shown by several of my own preoperative cases. While surface radiation cannot be relied on to cure with one application or set of applications a large tumour occupying most of the breast substance, it can be relied on with a great measure of probability to render no longer viable isolated groups of cells in lymph nodes and channels, and, in short, to sterilise the dangerous outlying field of the operation, when a movable small breast tumour has not already advanced beyond the early stage of axillary invasion. I have had about ten preoperative patients whose operation took place from three days to some months after the X ray application; in none of them was there faulty skin-healing of the scar. The cases were clinically so diverse that it is difficult to draw more conclusions than that (1) operation-scar healing is not delayed when the dose is adequate but not excessive; (2) some Stage I.–II. cases show three-year freedom from recurrence with preoperative and no post-operative radiation; and (3) some Stage II.–III. cases were made operable, and showed no local recurrence, although some died of metastases.

B. J. Lee and R. E. Herendeen have reported results with 92 patients showing the percentages alive and well in three years: after surgery alone, 24 per cent.; after post-operative radiation, 39 per cent.; and in those who had both pre- and post-operative radiation, 52 per cent. This illustrates the advantages of a combined method over surgical removal alone. They advise operation three or four weeks after the X rays; if it is performed earlier there may be hyperæmia. Neumann, F. Sluys and Coryn report good results from a rather similar combined technique (40 cases).

Radiation after Recurrence.

When "recurrence" has taken place, the results of X ray or radium treatment differ greatly according to the factors (some still undetermined) of site, type of growth, state of the patient, and method of radiation employed. The earliest noted "recurrences," those of pea or millet-seed size in or near the line of the scar, almost invariably disappear after surface X rays or radium. Larger nodes frequently become no longer palpable, or leave a small residue, after surface radiation with or without buried radium. My three-year "cure" of major recurrences, mostly supraclavicular or intercostal, on 165 cases with deep X rays or radium, is 22 per cent. One illustrative case may be summarised:—

CASE 1.—Aged 46; radical operation elsewhere, June, 1923. No post-operative X rays. By October, 1924, a massive scar recurrence, roughly 4 by 2 inches, and a ¼ inch thick, a nodule close to the sternum, glands in both axillæ, and in the right supraclavicular triangle. One high-voltage X ray course over these areas, followed on the scar area by a well-marked reaction, Grade I. All signs of disease disappeared after this, and the patient remains in good health. As prophylactic, a gland in the opposite axilla was treated in August and October, 1926, and a doubtful recurrence, a small tender right supraclavicular gland, was treated in October, 1927. There is now no sign of disease.

For patients with as widespread recurrence as this, X ray treatment is the more suitable. For a localised recurrence, for example in one supraclavicular triangle, half a gramme and upwards of radium element has been applied in a number of patients externally. The best results appear when the radium has been applied for suberythematous doses from 6 centimetres' distance in a "double-strength" intensity. Where a change is made from radium to X rays or vice versa, owing to an insufficient result, care must be taken not to overdose, as skin damage may result, with consequent bacterial infection and renewed growth of the residue. In no breast case has lung induration or severe blood damage been a result of treatment.

Post-operative Radiation.

Because in any given patient an incomplete operation may have been performed, some surgeons make a practice of referring patients for a "prophylactic" course of X rays. Analysis of 208 cases shows what wide variations there are in the state of the patient at the time of operation, the clinical and histological type of the growth, the method of operation, and other factors. It is safe to say that local scar recurrence can be almost completely abolished when patients have a post-operative course of X rays beginning within three or four weeks at latest after the operation. But in a considerable number of patients referred later than that, and in nearly a third of all this post-operative series, early signs of local recurrence in or near the scar, or in the axillary, parasternal, or supraclavicular glands, have been found when they were examined every six or eight weeks in the following year or two years. This shows the high proportion of incomplete operations, and the need for repeated examinations in the years following operation. If this were done in all patients after operations for malignant disease the end-results would be much better, for in almost every one of these breast cases, where definite or suspicious recurrences were noted at their earliest stage, further and more active radiation to that area has been followed by the disappearance of all signs of disease. The most lamentable cases seen, perhaps, by radiologists are those where breast or cervical operations have been followed by massive and practically hopeless recurrences; had the condition been recognised months before they would almost certainly have been curable.

Where the operability rate is high, and many of the patients are in Stage II. at operation, as at the Middlesex Hospital, the results of operation followed by a medium-voltage X ray course for one or two years, as shown by Sampson Handley's and some of G. Gordon-Taylor's figures, are approximately a 47 per cent. three-year freedom from recurrence. Handley has lately shown that in his Stage I. cases, with parasternal radium insertion and post-operative X rays, there has been 85 per cent. of "cures." Where operation is admittedly incomplete—i.e., where the axilla could not be cleared completely, or "recurrence" is evident a few weeks after the operation—the value of post-operative radiation may be demonstrated perhaps most conclusively. I have had 26 of these patients, all of whom were promptly treated with high-voltage radiation to the axilla and supraclavicular triangle; eight, that is, just under a third, showed no recurrence after two years. Without radiation it is not probable that so large a percentage would remain without signs of disease. Several patients have lived for over five years after growth was left adherent to the axillary vein, or was evident in the supraclavicular triangle at the operation or within a few weeks. An illustrative case may be summarised:—

CASE 2.—Aged 49; underwent radical operation in August, 1925, by Mr. E. L. Pearce Gould; the axillary vein could not be cleared completely. Four series of high-voltage treatments to the axilla and medium-voltage to the supraclavicular and scar areas followed. In February, Mr. Pearce Gould suggested that the treatment might be stopped. By October there were enlarged supraclavicular glands, which disappeared after two high-voltage treatments.

In April, 1927, there were two recurrent nodules in the line of the scar, which by June were no longer palpable after further high-voltage treatments. The patient remains free from signs of recurrence. This case shows the advisability of high-voltage supraclavicular applications in doubtful cases at least, and the inadequacy of an *incomplete* medium voltage X ray course to prevent the appearance of secondaries in the line of the scar. The full course is two years with ten treatment courses; this patient had three only; recurrences 9 and 15 months after.

Primary Cancer of the Breast.

(1) *Inoperable.*—About one-third of all patients coming with breast cancer to surgeons come in an inoperable stage, and for these much can be done by judicious irradiation; the ulcers heal, the cutaneous and deeper nodules disappear, and the arm becomes more movable and less swollen. Some patients may be rendered operable, and for these excision by the diathermy knife is especially suitable. Of 86 advanced inoperable patients the results have been satisfactory for more than a year in only about 10 per cent., as chest and other metastases become evident in so many patients and overshadow the breast condition. It has been found impossible to estimate beforehand, without actual trial of radiation, how any given patient will respond, and for this reason it is worth while commencing the treatment of many apparently hopeless cases, as a few will be markedly benefited. S. E. Pfahler and B. P. Widmann report in their series an average duration of life of five years and one month, as against two and a half to three years in untreated cases. An inoperable case well after 11 years may be summarised:—

CASE 3.—Aged 62; sent for X ray treatment by Mr. Sampson Handley in 1917, as there were too many axillary glands for operation. In April, 1922, the right breast showed nipple retraction as it had for years, but was otherwise satisfactory; there was a rather large right axillary gland, a small hard one in the left axilla, and one in the right posterior triangle. More X ray treatment was given. Seen at intervals since, there is no sign of disease, and the patient is in very good health.

(2) *Operable.*—I have now had 20 patients with operable breast cancer treated with X rays or radium or both, in all of whom operation had been refused, or was considered inadvisable. I am satisfied that radiation is a justifiable alternative to operation, as with radiation alone the percentage of success closely approximates to surgical results, and is at present rather better. Of my operable series published two years ago[1] (excluding two cases dying of intercurrent disease, one who discontinued treatment, and the fixed ulcerated case classed as "inoperable" when she began radiation treatment), there is a 75 per cent. three-year "cure" of Stages I. and II., and a 100 per cent. "cure" of Stage I. These percentages of results with X rays and massive surface radium are similar to those of Hermann Wintz and of Pfahler in their operable series treated by X rays; as radiation results they are only likely to be equalled by radium needle insertion methods such as those of Neumann, Sluys and Coryn, and of Geoffrey Keynes.

"Chronic Mastitis."

Much attention has been drawn lately to "chronic mastitis" as a precursor of cancer, and clinical observations have been confirmed by Bagg's work on breast functional activity and on milk-retention in mice after parturition, which produced cancer in a large percentage of nursing animals after duct ligature. Also the work of A. Rosenberg on the menstrual breast has important bearings on the subject (see below). Sir Lenthal Cheatle has drawn a clear picture of the comparison between the successive changes in the skin resulting from tar-painting, and the changes in the breast terminal ducts and acini of degenerative hyperplasia, cystic retention, papillomata, and final malignancy. A similar series of changes has been lately described in the colon. It is a reasonable deduction that the effective treatment of "chronic mastitis" will, in at least some cases, prevent the appearance of carcinoma. Little is known, however, about the beneficial effect of X rays on mastitis. The literature refers only to success with acute mastitis, as with other acute inflammatory conditions, and of a number of surgical authorities consulted Handley alone has been found to recommend X rays before operation in cases not responding to simpler measures.[2]

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[1] THE LANCET, 1926, i., 431.

I have had 60 of these "chronic mastitis" patients, and in over 90 per cent. the result has been perfectly satisfactory after, as a rule, about four medium or high-voltage treatments by cross-firing the breast. One or two have been operated on for large painful breasts, or for continued neuralgia-like sensations, and of those traced only one has been operated on for malignant change. This supervened a year after medium-voltage treatment to a large breast had been stopped. High voltage would have been better for such a large breast.

In this series of "chronic mastitis" were six or seven who had been sent as cases of doubtful "early carcinoma" in the larger nodules. As Ewing reports a carcinoma of 2 millimetres in size in a patient 21 years old, there may have been other cancers in the series! These results are, from all preventive points of view, noteworthy, and should be emphasised in any comprehensive campaign against cancer. It is an unfortunate tradition among patients that anything wrong with the breast probably means an operation, and I am convinced from many inquiries that the fear of operation is largely responsible for the high percentage of patients who come for treatment not in an operable stage, much less a "mastitis" stage, but in a frankly inoperable and, so far as we know as present, a practically hopeless condition.

Artificial Menopause as an Aid.

X ray castration has been recommended by several radiologists in every case of breast cancer. This procedure has recently received evidence in its favour on the histological side by Rosenberg, Polano, Berberich, Loeschke, and others. They have shown the remarkable proliferation of acini which takes place in the breast monthly and regresses in the intermenstruum. That a similar proliferation of cancerous epithelium takes place monthly has not yet been proved, as far as I know, by animal experiments. John Fraser, however, in a personal communication, writes that he has several specimens in his possession which suggest that the carcinomatous change receives a definite stimulus at the menstrual period, although he does not regard the matter as proved. I have seen patients whose recurrences were doing very well under radiation treatment suddenly flare up when menstruation began after a stoppage of some months. Such cases suggest strongly, on the clinical side, that it might be well to consider as a routine the production of an artificial menopause in all breast cancer patients who have not already reached the natural menopause. I have thus treated six advanced patients as a late resource. Advocated by Sir George Beatson, oöphorectomy has been found by Sir Holburt Waring to be of marked temporary service in about 30 per cent. of patients. As the X ray menopause can be induced in the great majority of patients in one to three hours with a minimum of disturbance, it is suggested that this is a matter which urgently requires discussion as a neglected but possibly valuable factor in the general treatment of cases, whatever local method be employed.

Conclusions.

1. It was once true, but is true no longer, that the only chance for the patient with cancer of the breast is early operation.

2. By radiological methods alone, or as the main treatment, results are being obtained in cancer of the breast similar to those in cancer of the cervix: a certain percentage of inoperable cases are cured, and the results in the operable group are rather better than those from surgery alone.

3. Combined methods of radiation and operation offer a fruitful field for further advances. The radiation artificial menopause is a little used but possibly valuable auxiliary treatment.

4. Radiological methods simulate and also encourage the natural attempt at cure, usually seen only in isolated subcutaneous nodules, by causing degeneration of the malignant cells and arousing a lymphocytic and connective tissue reaction. Experimentally, radiated areas have shown an immunity to tumour implantation; this is an additional argument in favour of pre- and post-operative radiation. The tumour bed and adjacent lymphatic glands appear to be stimulated (Douglas Quick and Max Cutler: in neck cases).

5. Operative removal is sometimes followed by the rapid growth of previously latent secondaries, possibly by loss of a "growth-restraint" of the primary (Ewing). For this reason, among others, conservative radiation methods may prove to be on the whole better, in some forms of cancer at least, than radical operation.

6. Experimentally and clinically the best way to stimulate a growth appears to be to cut into it. Clinically this has been seen in sarcomata, the inflammatory type of breast carcinoma (acute carcinoma incised by mistake for mastitis with immensely rapid growth following), and other carcinomata. (For inflammatory breast cancer radiation offers the only hope: Lee and N. E. Tannenbaum.)

7. In the hope of avoiding a considerable percentage of "recurrences" after incomplete operation, there is a very strong plea to be made out for invariable pre- and post-operative radiation of the operation area and the adjacent lymphatic drainage areas.

8. The present-day surgery of cancer may be said to be in a pre-Listerian stage. A new axiom might well be formulated and acted upon; no operations should take place on live unsterilised tumours.

9. The ideal method is for all new patients with malignant disease to be seen by the surgeon and radiologist in consultation. This was done at the Middlesex Hospital for some time by the late Mr. T. R. Kellock.[3] As a rule, however, the purely surgical view prevails, and radiotherapy is considered merely as an adjuvant to surgery—to be employed only when surgical means have failed, as surgery was once regarded by medicine. Sir Henry Gauvain has lately suggested how prejudicial to the public interest this segregation of radiological departments from the full clinical stream must be. Radiotherapy has become a new specialty of method, and there is much to be said in favour of giving the radiologist, as a cancer therapist primarily, a status of real equality with his other hospital colleagues, and the charge of a department with out-patients and beds, like that planned for Prof. Gösta Forssell in Stockholm—a 50-bed clinic in the new Serafimer Hospital.

If the voluntary hospitals, with their many other commitments, can make no full provision for advanced X ray and radium therapy in cancer, it is to be hoped that the Ministry of Health will initiate or support any movement for cancer clinics throughout the country (as in France) where the possibilities of radiotherapy may be fully explored. The annual mortality from breast cancer is about 5000, a thousand more than ten years ago in England, and surgical technique has been perfected for so many years now that there is not likely to be much lessening of the mortality unless expert radiological methods are more extensively employed than they are at present.

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[2] See Choyce's Surgery, second edition, 1923, ii., 28.

[3] THE LANCET, 1922, i., 552.

NEW BRIXHAM HOSPITAL.—Earl Fortescue, Lord Lieutenant of Devon, has opened a new hospital at Brixham, the gift of Mr. Charles Hellyer. There are 12 beds and two cots equally divided between the male and the female sides, and four private wards.

THE SACRO-ILIAC PROBLEM.

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Whether or not the sacro-iliac joint is ever liable to disabling displacements in the absence of severe trauma has been the subject of much discussion from time to time. Warm support has been given to the claim that manipulation, with or without strapping, cures or rapidly alleviates the distressing symptoms. These same claims have been equally warmly rejected. In the group of cases which form the subject of this report three factors have been constantly present.

(*a*) A history of relatively sudden onset of pain in the back following a muscular movement of the "surprise" type, and quite insufficient to cause a dislocation of a joint the size of the sacro-iliac synchondrosis.

(*b*) An inability to cough without pain and without accentuating all symptoms.

(*c*) A complete inability (not necessarily on account of pain) to lie flat on the back and lift both legs (when separated by about six inches) simultaneously off the ground with the knees fully extended.

All the patients have been more uncomfortable in a sitting position, or when passing from this to standing, than when fully erect. The majority also have been unable to roll in bed towards the affected side without a spasm of radiating pain.

A medical man who has suffered from this distressing condition described his history and symptoms to me in detail as follows:—

"At the time of the onset I was just recovering from a rather prolonged and debilitating attack of bronchitis. One morning, when sitting at stool, I was seized with a more than usually severe bout of coughing and suddenly 'felt something give' in the region of the left sacro-iliac joint. There was no pain. Nor was there any pain to speak of on first standing, only a vague discomfort. Very shortly after I bent to pick up a small bag, weighing a few pounds, and my return to the standing position was accompanied by an almost intolerable hot and stabbing pain which radiated down from the original spot to the back of the knee and left the whole of the back of the left thigh with a woolly, heavy feeling. Walking was not painful, only uncomfortable, and a limp did not develop until later. Work and duty could be carried out, though with a sense of insecurity. After some two weeks of this condition the stabbing attacks disappeared, leaving a continuous 'lumbago' backache with the whole of the left leg feeling heavy and somewhat unmanageable. At this stage the ilium, where it abuts on the sacro-iliac joint, felt more 'lumpy' than on the unaffected side. I was told, though personally I was unaware of it, that my trunk was no longer erect, but bent forward and to the left. The nearest approach to a comfortable position was standing with the left leg behind and the shoulders thrown back. Diathermy, ionisation, ultra-violet light, and radiant heat gave only temporary benefit."

When examining this patient I noticed for the first time a curious sign—namely, that while he could lie on his back and lift each leg with the knee straight without difficulty or pain, he appeared to have absolutely no power to lift both legs together. It was not a question of impending pain; he simply might have been paralysed for this particular movement. Passive movements without an anæsthetic, radiant heat, and strapping effected a reasonably rapid recovery.

Since then I have come to recognise that the double-leg-lifting test is important in distinguishing one group of "backache" cases from all others. It has been possible to collect a considerable number of these cases, both in hospital and private practice, and they all conform so closely to the first that it will be sufficient to give brief notes of two or three.

Case 1.—A man, aged 26, was in a motor collision on May 4th, 1927, but was not turned over or thrown out; he thinks he swung suddenly to save himself from impact. He complains of pain deep in the left flank. Coughing hurts and shoots pain down the distribution of the left sciatic nerve. X rays show no bony injury or abnormality. On examination, single-leg-lifting is difficult, but can be carried out. Attempted double-leg-lifting produces no movement whatever of either leg—"no pain, just can't do it." Gripping the iliac crests, so as to close them up, immediately makes it possible to commence this movement. Pressing the iliac crests apart produces the same pain as coughing.

Treatment.—Absolute rest in bed, anodal galvanism, massage, movements, and gradual re-education effected complete recovery for general office work in three to four weeks, but a ban was put on rowing races.

Case 2.—A married woman, aged 54, tried to lift a bed on Dec. 5th, 1927. Two or three hours later she noticed pain low down on the left side of the back. Sneezing and coughing were most painful; in some positions—e.g., getting in or out of a bath—acute pain radiated over the buttock. Rest in bed, ionisation, massage, and hot baths for a week did no good. When seen on Dec. 15th examination was very difficult on account of rolls of loose fat all round the loin, &c. Double-leg-lifting was, however, impossible and separating the iliac crests made any effort to raise the legs more difficult, while closing them made it possible to move the legs slightly.

Treatment.—Direct current was administered and the patient wore a corset with a pad of wool while resting in bed, with a pillow under the buttock. Massage was given, at first avoiding all passive movement. By Christmas Day the patient was well enough to go into the country and recovery was uninterrupted.

Case 3.—An unmarried woman, aged 42, complained of pain in her back six and a half years ago. This definitely began after lifting a child aged 4 and running with her; she "felt something go" on the left of the spine, and has felt pain at intervals ever since. "I may go for weeks and months without discomfort, then a slight something sends a stab of pain down the left of my back and for a time after this any movement causes excruciating pain." When seen on March 7th, 1927, she stated that while changing her frock for dinner she had felt something click, with slight pain which afterwards gradually increased until at 9 A.M. she was completely incapacitated. Double-leg-lifting was impossible. Single-leg-lifting caused no difficulty and there was very little difference between the sound (right) side and the painful side.

Treatment.—Strapping, accompanied by Bristow coil treatment to all the muscles in the region of the left sacro-iliac joint, rapidly made the patient well, and by learning how to use the apparatus on herself she has been able to keep well.

The next case illustrates another aspect of this interesting group.

Case 4.—A woman, aged 38, on trying to stand on her hands in January, 1924, "ricked her back" and ricked it again the same evening while dancing; this was followed immediately by pain in the back, made worse by any forward-bending movement. Coughing was painful except in the full knee-bend position, and pain could be diminished by holding something in front of her (in effect fixing the ribs, see later). On April 2nd, 1925, she caught a "chill" in church and then the pain returned, only worse, and went down the legs in a spasm. A celluloid corset, partially immobilising the sacro-iliac joints, was a great help.

Case 5.—A man, aged 22, strained his back wheeling a barrow in June, 1927. There was no slip or sudden emergency and he went on working after the pain began. He got well, but when skipping in September, 1927, the pain returned down the right leg and was also felt on sitting or coughing. On Dec. 20th, when first seen by me, this pain was still present and prevented all games. The X rays were normal. The double-leg-lifting sign was present and hypertension of the thighs relieved the pain. In the forward-lying position the iliac side of the sacro-iliac joint on the affected side appeared to project more prominently than on the healthy side. As this asymmetry largely disappeared after treatment, it is worth noticing, particularly as it has been noted in other cases. Treatment was carried out, as described below for the more severe and long-standing cases, and recovery has proceeded satisfactorily.

Case 6.—A woman. The original injury was caused by turning to the left and leaning over to lift a coal scuttle; the right foot slipped on some grease and a feeling of something that "went" in her back was followed some days later by a disabling pain in the back and down the left thigh. In this case, rest in bed, strapping, and jackets only effected temporary improvement. On examination in the forward-lying position the sacro-iliac joint on the injured side was so loose that Mr. J. Cunning considered it justifiable, after all other methods had failed, to fix a screw through the joint. This he carried out successfully on Jan. 17th, 1923, and the patient was able to resume her duties as cook-general and has carried on successfully ever since. An X ray of the sacrum taken on Feb. 14th, 1928, by Dr. Bertram Shires showed the screw in its original position.

The strength of the vaccine was 1 mg. per c.cm. There was no apparent result save that the granulations of both operation wounds increased greatly and became very vascular. Twelve minims were injected on August 12th. and the granulations were painted with a mixture of brilliant green and methyl-violet in equal parts of a 5 per cent. solution in alcohol, and the abscess cavity was packed with strips of gauze soaked in the same solution. One c.cm. of the vaccine was given on August 24th, and it was decided to abandon the large doses of iodide preparations which she had been having by mouth, as *during the whole of the* illness no intravenous injections could be made owing to the fact that it was found impossible to distend any of the superficial veins sufficiently, and it was of course impossible to suggest cutting down on veins for this purpose.

No progress was made up to Sept. 17th, when she was seen by Sir Chartres Symonds. There was then bulging in the side behind the first operation wound and it seemed likely that another abscess was forming in this position. It was decided to continue the vaccine treatment and await further developments. Twenty minims were given on Sept. 28th and 22 minims on Oct. 1st, and on the latter date the temperature reached normal for the first time since April, and after Oct. 7th showed no evening rise. The granulations had by this time completely disappeared, leaving a healthy sinus from front to back and the swelling in the side was much smaller. The vaccine was injected weekly until the end of October, and, subsequently, fortnightly. The sinus had closed by Nov. 4th and vaccine treatment was continued at monthly intervals until June. 1927.

She is now in perfect health and able to carry on her duties as a masseuse.

Notes on Bacteriology by DR. BRAXTON HICKS.

On May 28th I received from Mr. Turner some pus and three pieces of tissue. After prolonged search through several smears of the pus, a few filaments and one mass of streptothrix were encountered, and rapid sections of the three pieces of tissue showed streptothrix in only one. Attempts to cultivate the streptothrix failed.

Mr. Turner asked my opinion as to the possible success of an autogenous vaccine, as the patient's condition was desperate. Recovery has been recorded even with a stock actinomycotic vaccine, for the difficulty in providing an autogenous vaccine arises from the inability to induce the streptothrix to grow on artificial media in every case. However, some fresh pus having been sent by Mr. Turner on July 30th, a fairly abundant growth of the streptothrix was obtained in glucose broth under anaerobic conditions (Mackintosh and Fildes jar). Subcultures (fortunately *luxuriant*) were only obtained on the first occasion, all attempts to raise a second series failing. After centrifugalising down from the broth cultures, the streptothrix was washed several times in saline. The supernatant saline was removed from the last washing as far as possible to the last drop, the resultant wet mass being ground up in a small sterile agate mortar. This squeezed out a certain amount more fluid, which was dried off in an oven, taking great care not to dry out the mass completely. A slightly moist mass resulted, which could be weighed, and an original stock suspension was made up of a strength of 1 mg. per c.cm., of which the patient had an initial dose of 0·05 mg. in August. Later on (October), in the course of the disease, the stock was increased to 4 mg. per c.cm.

In discussing the part the vaccine played in this case it must be remembered that the patient had many lines of treatment going on at the same time. I have seen a number of cases of streptothrix infection of abdominal and thoracic regions, *but I do not* remember to have seen one clear up on iodine or iodides. These always are, and should be, tried. The brilliant green and methyl-violet mixture kept the wound clean and lessened the exuberance of the granulations, but there is evidence that the vaccine clinched the cure. Soon after the vaccines were started the granulations became vascular and large, and I think that was a sign of progress in healing, for the granulations in streptothrix are not particularly vascular. Moreover, in the latter part of September, a swelling was developing *in the region* of the original operation wound. At this time the vaccine had been pushed up to 1 mg. of the streptothrix mass and immediately after this dosage had been reached the temperature began to reach normal and the swelling to subside. The increase in the dosage was continued systematically and carefully, until she was taking 4 mg. of the *streptothrix mass*, so apparently large doses are easily tolerated.

A CASE OF

POST-VACCINAL SEROUS MENINGITIS.

By F. E. SAXBY WILLIS, M.C., M.D., M.R.C.P. LOND.,

PHYSICIAN IN CHARGE OF OUT-PATIENTS, ROYAL CHEST HOSPITAL AND HAMPSTEAD GENERAL HOSPITAL.

ALTHOUGH a number of cases of encephalitis and myelo-encephalitis following vaccination have now been reported, chiefly in the French literature, meningitis in this connexion seems to be a rare complication, and the following case may therefore prove of interest.

A school-boy, aged 11, was admitted to the Weir Hospital, Balham, on May 20th, complaining of headache, pain in the neck, and drowsiness. A fortnight before admission he had been vaccinated against small-pox. A week later he had complained of headaches and pain in the neck, becoming semi-comatose two days previous to admission.

On admission he was drowsy but irritable, and could be roused. Four pustules were present on the left arm. Nothing abnormal could be found in the heart, lungs, or abdomen. In the central nervous system, apart from the drowsiness, no definite abnormality could be detected at first, but by the fifth day general hypertonus had developed and Kernig's sign was present. The knee-jerks were not obtained, the plantar response was doubtful on the right and extensor on the left. There were no ocular palsies, and the fundus occuli was normal in each eye. Fever was present (102° F. on admission, falling to normal by the third day). Lumbar puncture was performed on May 20th, and fluid withdrawn under considerable increase of pressure. The latter was reported on as follows by Dr. Mary Schuster:—

> "A water-clear fluid, with little deposit after centrifugalising, cells 50 per c.mm.; small mononuclears, 65 per cent.; large mononuclears, 30 per cent.; polymorphonuclears, 5 per cent.; a few red cells; sugar diminished in amount; chlorides, 0·67 per cent. (diminished); albumin, 0·03 per cent.; organisms: cultures sterile, no tubercle bacilli found; Wassermann negative."

On May 26th considerable improvement took place, and by June 8th the patient was quite bright mentally and had no symptoms. By this date the reflexes were normal and the patient was apparently fully recovered. He was discharged on June 10th.

In my opinion the clinical features, with the definite increase in the cell content of the cerebrospinal fluid, place this case in the category of what Stiner refers to as "serous meningitis" rather than of an encephalitis.

References.—Levaditi, C., Nicolau, S., and Sanchio-Bayarri, V.: *Presse Méd., 1927,* xxxv., 161. Turnbull, H. M., and McIntosh, J.: Brit. Jour. Exper. Path., 1926, vii., 181. Winnicott, D. W., and Gibbs, N.: Brit. Jour. Child. Dis., 1926, xxiii., 107. Stiner: Quoted by Winnicott and Gibbs.

DONATIONS AND BEQUESTS.—Mr. and Mrs. J. B. Crichton, of Luthriebank, near Cupar, have given £10,500 to meet the cost of the upkeep of Adamson Cottage Hospital, Cupar. Mr. Crichton recently gave £5000 to the hospital. —Dr. R. Tudor Williams, who was drowned recently while bathing at Villerville, France, left the following legacies to North Wales Institutions: £500 to the Carnarvonshire and Anglesey Infirmary at Bangor, and £100 to each of the following: Llanfairfechan Nursing Association, Leeswood (Mold) Nursing Association, Caergwrle and Hope Nursing Association, Tryddyn (Mold) Nursing Association, Caergwrle Presbyterian Church, and Horeb Chapel, Llanfairfechan. —Miss Lucy Prince-Smith, Bournemouth and Staintondale, Scarborough, besides many other bequests, left £10,000 to the Royal United Kingdom Beneficent Association for general purposes, £2000 each to the Leeds General Infirmary, the Royal Victoria and West Hants Hospital, Bournemouth, the Royal National Sanatorium, Bournemouth, and the Victoria Hospital, Keighley; £500 to the Driffield Cottage Hospital, £1000 to Dr. J. Nicholson Dobie, of Keighley, and subject to certain other bequests, the residue of her property equally between the Leeds Infirmary, St. Catherine's Home, Bradford, the Royal Victoria and West Hants Hospital, Bournemouth, the Royal National Sanatorium, Bournemouth, and two other institutions.—An anonymous donor has given £1000 to the University of Manchester to be applied for general purposes as the council may determine.

Reviews and Notices of Books.

THE ROBERT JONES BIRTHDAY VOLUME.

A Collection of Surgical Essays. London: Humphrey Milford, Oxford University Press. 1928. Quarto. Pp. 446. £2 2s.

LAST week we reported the presentation of this volume at a dinner given to Sir Robert Jones by the authors of the essays contained in it, including the preface by Sir Berkeley Moynihan, and an appreciation by Sir John Lynn-Thomas. With the exception of the first article by Mr. Muirhead Little, which treats of the history of orthopædic surgery, all the essays are on clinical orthopædic subjects. The list of contributors of these, which includes five distinguished foreign specialists as well as one Canadian, is in itself evidence of the value of this volume as a serious contribution to orthopædic surgery. The editors tell us in a prefatory note that the idea of this book originated among Sir Robert's friends on the Council of the British Orthopædic Association, and that the 24 authors were selected from among his personal friends, those American and continental surgeons who had come under his influence chiefly during the war, and those British surgeons who have worked under him in the military orthopædic and pensions hospitals. A glance at the names of these writers prepares the reader for much interesting and instructive matter; it is proposed here to give in a bare outline some idea of their merits.

Prof. Osgood, of Boston, heads the list of foreign contributors with an essay on the frequent association of intestinal stasis with spinal sacro-iliac arthritis, a topic which is much thought of just now. The cases recorded fully justify the hypothesis implied in the title. Dr. Murk Jansen, of Leyden, has a reputation as a surgical pathologist which will suffer no diminution from a study of his paper on dissociation of bone growth. Prof. Putti, of Bologna, contributes a paper on two cases of tumour of the femur, which admirably exemplifies his resourcefulness and skill in bone-grafting. Prof. Nathaniel Allison, of Harvard, discusses open operations for congenital dislocation of the hip. Although he admits that manipulative reduction often gives good functional results, he prefers the security of a reconstructed acetabulum when risk of ankylosis is avoided by preserving the capsule. The same subject is dealt with by Prof. Hey Groves, who, however, is more optimistic as to the results of manipulative reduction in patients not too old. Dr. Jacques Calvé, of Berck-Plage, treats of a rare affection, infantile vertebral osteochondritis which he first described in 1924. The condition is of some importance, as it may be mistaken clinically for Pott's disease, unless radiographs are truly interpreted. This article, which is in French, is well illustrated with X ray pictures. Prof. Clarence Starr's short essay on acute infections of bone drives home the lesson that osteomyelitis should be detected and treated much earlier than is as yet usual. Mr. R. C. Elmslie's work on fibrocystic disease of bones is well known, and his words here add to our knowledge of the subject. Radiology has enormously increased our knowledge of ossification of the skeleton and its anomalies or rarities. Dr. Thurstan Holland's paper on the accessory bones of the foot conveys the results of great experience in this field, and is a valuable guide in the differential diagnosis between injury and abnormal development. Mr. Brownlow Mitchell, of Belfast, explains the mechanism of the production of spiral fractures and discusses their treatment. His X ray pictures show excellent results. The subject of peripheral nerve complications of fractures and dislocations of the elbow is an important one, for, as Mr. Harry Platt says, they may be the grounds for unfavourable criticism of the surgeon and even actions at law. The careful study of his paper should make such misfortunes rare—this is a very thorough paper. The president of the British Orthopædic Association, Mr. H. A. T. Fairbank, gives us a well-documented and reasoned essay upon infantile cervical coxa vara. Mr. McCrae Aitken writes on curvature of the spine. Mr. Rowley Bristow on cysts of the semilunar cartilages of the knee, the pathology of which he discusses thoroughly, and the same subject is touched on by Mr. S. Alwyn Smith in sidelights on knee-joint surgery. Mr. Blundell Bankart contributes a short but practical paper on dislocations of the shoulder-joint, including all its forms and ætiologies. Sir W. I. de C. Wheeler writes judiciously of bone-grafting in advanced cases of Pott's caries, and gives a table of the results in a consecutive series of 30 adults. Adult cases of Pott's disease are notorious for their high death-rate, but Sir William Wheeler only lost six of this series, one of whom, moreover, survived six years. Mr. G. R. Girdlestone's paper on arthrodesis and other operations for tuberculosis of the hip, and that of Mr. Laming Evans on astragalectomy are worthy of their position in the volume. Mr. Naughton Dunn on arthrodesis of the tarsus for foot deformities and Mr. W. H. Trethowan on fracture-dislocation of the ankle-joint deal with subjects of which they are acknowledged masters.

We have spoken with uniform praise of the contributions, and the high standard reached by them shows that all the writers considered the occasion as one in which they should put forth their best. The volume is well got up and fully illustrated, and any profits from its sale will be given to Sir Robert Jones for the funds of his scheme for the care of cripples.

HISTORY OF MEDICINE.

Storia della Medicina. By ARTURO CASTIGLIONI, Professor of the History of Medicine, University of Padua. Milan: Società Editrice "Unitas." With 389 illustrations and 3 colour plates. Pp. 972.

As the standard Italian histories of medicine were published over 60 years ago, and were even then incomplete, there was obviously need for a book to carry on the story and incorporate the results of recent research. It is peculiarly appropriate that the long record of medicine should attract Italian students, for nowhere else do past and present so meet and mingle as in Italy. From the busy streets of Milan one may step into the vast Ospedale Maggiore, founded in 1457 and still little changed since the seventeenth century, with its huge wards that have never lacked patients through the centuries. And in Siena it is even more striking to cross from the cathedral, with a constant stream of tourists pouring into it from luxurious motor-cars, and enter the great Hospital of Sta. Maria della Scala, founded in the eleventh century as a refuge for pilgrims as well as a hospital, where Santa Caterina laboured from day to day and S. Bernardino ministered to the victims of the plague in 1400, and where, out of an entrance hall frescoed by Sienese primitives, one passes at once into operating theatres and laboratories equipped with the latest inventions of medical science.

Of late years medical historians have been busy, and have gathered a rich harvest, and now the English reader need be at no loss for information, both authoritative and attractively set forth. Italy, with her awakened energies and self-consciousness, is leaving no field untilled, and it is fitting that, from her ancient and honourable University of Padua, Prof. Arturo Castiglioni should send out this stately and well-illustrated volume, in which the history of medicine is followed down to our own time. To cover so rich a field the author has, of course, been obliged to omit much; but he has arranged his material skilfully, and the significant peaks in medical history stand out clear, and the thread of interest is continuous and absorbing.

For English readers the most useful parts of the volume will be those wherein the achievements of Italians are described with legitimate pride—especially the later chapters in which the long succession is approve of birth control because they are dominated by ego-instincts. No suggestion is made as to why one instinct should predominate over the other in a given individual, and the remedy proposed by Dr. Eder as a solution of the conflict may strike the reader as banal. "Education," it is said, "is the weapon with which such *opposition is to be fought*." While both books may well be of interest to lay readers, it does not seem likely that they will prove very informative to members of the medical profession.

This statement, however, does not hold of the third book under review. The author of "Parenthood: Design or Accident?" is a medical man writing under a pseudonym, and the book fulfils a real need. The author clearly has had considerable experience of contraceptive methods, and his little book is compact and relevant. Its most valuable feature is the comparative treatment of the indications for the use of different contraceptive methods, and this book may be recommended as containing one of the most impartial and balanced discussions of the practical and technical aspects of birth control that has yet appeared from the pen of a medical writer.

The standpoint from which the last book of the series is written, and also the motive which inspired the author to write it, are summarised in the following sentence of the preface:—

> "From the correspondence that has been printed in the various London journals during the last two or three years, it would appear that there is a large body of public opinion in this country which, although not resting on the foundation of any religious orthodoxy, is strongly opposed to birth control, and it is partly with the view of providing those who represent this body of opinion with as complete a statement as possible of the case against the new teaching, and also of giving them an alternative solution, that this work was undertaken."

From the outset, therefore, the book compels attention. The criticisms of birth control here advanced do not emanate from a theological assumption as to the nature of God's will, nor from a biological dogmatisation as to what is and is not "natural." They emerge from certain sociological, psychological, and medical considerations for which much interesting evidence is adduced. The essential thesis of the book is the contention that by modern contraceptive methods good stocks are eliminated as much as, or even more than, bad ones. The reduction of the birth-rate is achieved at the expense of valuable, rather than of useless, strains. The selection is blind. Birth control is a process of night-hoeing, in which the wheat is likely to be cut down with the tares. The author argues that the problems of over-population and degeneracy are intimately linked with one another, and that any reduction of the population which, in the future, may prove necessary should first and foremost be a purgation of degenerates. And the author outlines a policy to guide us in such a purgation. Of the books written in recent years against the practice of birth control this is by far the best. The author has been at pains to acquaint himself with the voluminous literature which the subject has now acquired, and he writes with a trenchant lucidity which makes his book a pleasure to read.

AN APPROACH TO WINGED FLIGHT.

By JOHN D. BATTEN, M.A. Brighton: Dolphin Press. With photographs. Pp. 78. 5*s*.

THIS little book contains much new and original information and is illustrated by eleven photographs and ten line drawings which render the exposition clear. Mr. Batten begins by pointing out the essential difference between the flight of insects and that of birds, it being the latter with which his experiments are concerned. In many birds, especially the larger birds such as the albatross and the condor, flight is attained by keeping the wings almost stationary on the principle of gliders. This suggests that the pectorales majores exert almost entirely a *postural activity*, their function being to keep the wings from flapping upwards, just as the chief function of the quadriceps extensor is, not to extend the knee, but to keep the knee from bending. Mr. Batten has found that a twisted skein of natural silk, as obtained from the cocoon, forms an exceedingly strong and light spring to maintain the wings of his model horizontal. A four-skein torse of 23 in. span twisted by a rod or lever in the middle will sustain a boy "weighing 8 st. 2 lb. hanging by his hands 2 ft. 6 in. out along the lever" which is then horizontal. If desired the mere weight of the man could maintain the wings horizontal, but this appears to be more than is required.

In the tentative model (Photos. VI. and VII.) the man's hands grasp two levers controlling the two wings while his feet rest on a firm base board. When his knees are slightly flexed, the wings are horizontal, by pulling against the base board and extending his knees, as in rowing, the wings are depressed, and on bending his knees and relaxing his muscles the wings are raised. The upward movement of the wings will occur from the fall of the body between the wings when the pressure of the air will raise them. If the rhythmic movement be in the same phase and of the same period as the oscillation period of the wings, the wings can be flapped with very little exertion and practically no fatigue. Great attention has been paid to the problem of rising easily from the ground, and also to that of landing.

The book contains valuable suggestions for all who are interested in the problem of flight.

JOURNALS.

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These small criticisms are called for in case of a further edition appearing, but on the whole the information supplied is reliable and clearly presented, while the book gives in convenient compass much information of interest to the practitioner. It is well printed, beautifully proportioned, and sufficiently illustrated. Three coloured plates show the Dick reaction, the Schick reaction, and diphtheria membrane. These are all very good, and the illustrations of severe pharyngeal diphtheria and typical tonsillar diphtheria are particularly worthy of praise.

An interesting introductory chapter is supplied by Dr. Edward S. Godfrey, Director of the Division of Communicable Diseases, on the responsibility of the attending physician in cases of communicable diseases, and the chapter on tuberculosis in children is by Dr. William E. Lawson, physician-in-charge, Albany Hospital Tuberculosis Sanatarium.

MEAT INSPECTION.

The Principles and Practice of Meat Inspection. By GERALD LEIGHTON, O.B.E., M.D., D.Sc., F.R.S.E., Medical Officer (Foods), Scottish Board of Health. London: W. Hodge and Co. 1927. 25*s.*

THE book is divided into two parts: Part I. dealing with General Principles, and Part II. with Regional and Special Meat Inspection. Part I. includes accounts of methods of inspection, of meat and its characters, of the lymphatic system, and of the general pathology, parasitology, and bacteriology of meat inspection, with chapters on Abattoirs and Slaughter-houses and on Methods of Slaughtering, the latter taking up no less than 34 pages. The last chapter in Part I. is entitled Judgment and Condemnation, and it is unfortunate that its ten pages should be confined to the Scottish instructions and the English recommendations. This chapter might have been amplified with advantage and have included a discussion of the scientific grounds for these official recommendations, since many difficulties arise in practice and the subject is of great importance.

Part II. is a clear and valuable account of the different abnormal conditions which may be found. The arrangement is a little difficult to follow, since one chapter deals with one disease (tuberculosis), the next with diseases in one animal (swine), while of the following chapters some deal with special organs and others with special regions (thorax and abdomen). Thus tuberculosis of the pig is discussed in one chapter while paragraphs on tuberculosis of swine are found elsewhere. Two useful sections are devoted to edible fish and inspection of fish, while notes on inspection of game and poultry are also included. The term "meat inspection" in this volume is used in a very limited sense. Very little is said about the characteristics and inspection of imported meat; the large and important subject of made-up meat foods is entirely ignored, while reference to canned foods is confined to a quotation from an American paper on the examination of spoiled canned foods, which is mainly a discussion of laboratory methods and gives no help in practical inspection work.

The book is for the most part a guide for the meat inspector working in public abattoirs or slaughter-houses. Good advice is given for the detection of gross pathological lesions, but while this is the most important aspect of the practical work of an inspector the value of the microscope and of other auxiliary methods of investigation deserve his attention. Such methods stimulate interest, advance knowledge, and supply additional proof in cases which come before the courts. The author does point out that "a standard text-book on bacteriology should always find a place on the meat inspector's book-shelf," but he does not emphasise the fact that the trouble of taking it down from the shelf and studying it will be rewarded. The illustrations are numerous and for the most part excellent.

BIRTH CONTROL.

Some More Medical Views on Birth Control. By Eleven Contributors. Edited by NORMAN HAIRE, Ch.M., M.B. London: Cecil Palmer. 1928. Pp. 239. 7*s.* 6*d.*

Medical Help on Birth Control. By Fourteen Contributors. London: G. P. Putnam's Sons. 1928. Pp. 225. 6*s.*

Parenthood: Design or Accident? By MICHAEL FIELDING. London: Labour Publishing Company. 1928. Pp. 96. 2*s.* 6*d.*

The Night Hoers. By ANTHONY LUDOVICI. London: Herbert Jenkins, Ltd. 1928. Pp. 288. 7*s.* 6*d.*

THE first of these books is produced as a counter to a book, edited by Sir James Marchant, and reviewed in THE LANCET, 1927, i., 1165, the tone of which was unfavourable to the practice of birth control. Dr. Haire points out that not one of the eight contributors to Sir James Marchant's book appeared to have had any considerable experience of contraceptive practice. He also states that the average age of these eight contributors is 62, and suggests that their views may not be representative of the medical profession—particularly of its younger elements—as it exists to-day. The second book is offered to the public in response to the statement recently published in the *Church Times*—viz., "the public has a right to expect better guidance from doctors than it gets at present in this matter." Both books, therefore, consist of a collection of essays written, with two exceptions, by medical men or women favourably disposed to the practice of contraception. They are intended for the general public Comparatively little is said about the purely medical aspects of this question. Religious, ethical, and sociological arguments, most of which have been used before, are advanced with a considerable amount of repetition. To those acquainted with the literature of the subject, the most interesting essay is that appearing in the second book, by Mr. Warren R. Dawson, entitled "Early Ideas upon Conception and Contraception." This contributor adduces new evidence as to the practice of contraception by the early Egyptians. A novel point of view is that propounded in the first volume by Dr. M. D. Eder, writing upon the subject of the psychology of birth control. This essay does not contain, as might have been hoped, an account of the psychological effects of the various contraceptive practices upon different people. It is concerned with an exposition of the psycho-analytic theory of why people approve or disapprove of birth control. According to this theory, people disapprove of it because they are animated by "life instincts." And people approve of birth control because they are dominated by ego-instincts. No suggestion is made as to why one instinct should predominate over the other in a given individual, and the remedy proposed by Dr. Eder as a solution of the conflict may strike the reader as banal. "Education," it is said, "is the weapon with which such opposition is to be fought." While both books may well be of interest to lay readers, it does not seem likely that they will prove very informative to members of the medical profession.

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JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES. Vol. XXV. April-June.—Dr. C. P. Symonds contributes a critical review on encephalitis periaxilis diffusa—Schilder's encephalitis. He states that until the publication of papers by Bouman, and Collier and Greenfield in 1924 this disease was unknown except to a few neurologists. It usually occurs in children and young subjects without any obvious cause. The onset lasts a few days and the course is progressive with some remissions to a fatal issue after a duration ranging from a few months to three years. The chief early sign is cerebral blindness, which is followed by mental impairment and increasing spastic paralysis. The condition is usually bilateral but may commence on one side or be confined to one side. The disease may begin in the occipital lobes or in some other part of the brain. In several cases a familial incidence has been noted, which is in favour of an infective cause such as neuro-syphilis, or indicates inherited abiotrophy. Post-mortem examination shows areas of softening in the central white matter of the affected lobes. Histologically, there is general infiltration of the brain with round cells engaged either in the removal of myelin or the formation of glia fibrils. The vessels are surrounded with fat-laden granule cells, phagocytic cells of glial origin, and small round cells of the size and shape of lymphocytes.—In a paper on Hemiplegia associated with Extensive Nævus and Mental Defect Dr. T. Brushfield and Dr. W. Wyatt describe the pathological changes found in the cases of which they had previously related the clinical features. They conclude that the paralytic manifestations may be ascribed to the presence of intracranial nævi and the mental defects only partly to this cause, as they found a definite under-development of the neurones throughout the brain.—Dr. Eric Pritchard reports an Atypical Case of Achondroplasia, illustrated by skiagrams, and comparable to the atypical forms found in animals such as pug dogs.—Dr. Kaj. H. Baagoë, of Copenhagen, records his Investigations on the Pirquet and Wassermann Reactions in Asthmatic Children. From examination of 83 asthmatic children, aged from 2 to 15 years, he found that a positive Pirquet reaction was not more frequent than among ordinary hospital children, thus confirming Wallgreen's view that there is no ætiological connexion between hypersensitiveness to tuberculin and asthma. Examination of the Wassermann reaction in 92 asthmatic children showed that it was invariably negative with the exception of a child suffering from syphilis acquired at the age of 1 year. Baagoë's investigations therefore do not support the view that syphilis plays any part in the development of asthma. —Dr. Robert Hutchison reports a case of Severe Anæmia Treated with Liver in a boy aged 6 years. The case was apparently an example of anæmia gravis, not pernicious anæmia. Immediate and striking improvement, however, followed administration of cooked liver.—Dr. A. Joe records a case of Gangrenous Chicken-pox associated with *B. diphtheriæ* in an infant aged 13 months, which ended fatally.—An Anomalous Case of Deafness Successfully Treated by the Electrophonoïde Method is related by Mr. Macleod Yearsley[1] in a boy aged 10, in whom the deafness was probably due to delayed development. The abstracts from current literature are devoted to diseases of the blood and spleen.

INDIAN JOURNAL OF MEDICAL RESEARCH. Vol. XV. April, 1928.—Dr. A. N. Goyle describes comparative experiments on the transmission of plague by fleas of the genus xenopsylla in which he has demonstrated the superiority of *X. cheopis* over *X. astria* as transmitters of the plague bacillus.—A. C. Craighead and S. Das give an account of a survey of Pusa Estate, the headquarters of the Imperial Department of Agriculture, for sandflies of the species *Phlebotomus argentipes.*—R. N. Chopra, J. C. Gupta, and N. N. Ghosh have studied the Indian varieties of aconite, their chemical composition and biological assay, while the senior workers with various collaborators have completed *similar pharmacological* studies on emetine, ephedrine, and the physical properties of different blood sera.—M. T. Bhaskara has elaborated a technique for making a fairly complete post-mortem examination through an incision in the upper abdomen.—R. McCarrison contributes papers on experimentally produced lymph-adenoid goitre and *on the influence of irrigation* on the nutritive value of rice.—S. S. Sokhey and M. A. Malandkar write upon the pancreatic function in sprue.—W. F. Harvey and K. R. K. Iyengar on *the development, duration, and restoration* of immunity.—W. C. Ross has two papers on cholera.—R. Senior-White, G. Covell, and Bruce Mayne have several contributions in connexion with malaria.—R. Knowles and B. M. Das Gupta record their laboratory studies on Surra, and H. W. Acton describes ainhum, a band scleroderma.

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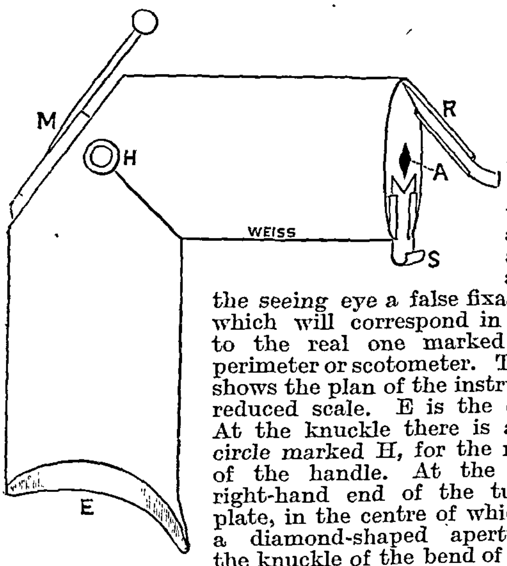
[1] THE LANCET, 1927, ii., 1285.

New Inventions.

THE SCOTOGRAPH.



THIS is an instrument designed to facilitate the fields of vision where there is a central scotoma. Field-taking is difficult where the macula of one eye is out of action. The device shown gets over most of these difficulties. A tube is bent at a right angle midway in its length, and the two arms are so arranged as to give the seeing eye a false fixation spot which will correspond in position to the real one marked on the perimeter or scotometer. The figure shows the plan of the instrument in reduced scale. E is the eyepiece. At the knuckle there is a double *circle marked* H, for the reception of the handle. At the extreme right-hand end of the tube is a plate, in the centre of which is cut a diamond-shaped aperture. At the knuckle of the bend of the tube is a large hole covered with a hinged lid M, fitted *inside with a plane mirror.* The patient holds the instrument (the instrument can be fitted with a crank arm to clip on the upright of the perimeter if preferred) before the eye which has fixation power. He sees the patch of light reflected from the mirror lid at the knuckle. The field of vision of the other eye and the scotomata are thereon mapped out. The instrument can be used for either eye.

The Scotograph is made by Messrs. J. Weiss and Son, Ltd., 287, Oxford-street, W.

N. BISHOP HARMAN, M.B., B.Chir. Camb.,
F.R.C.S. Eng.

Reports and Analytical Records.

SAVOY CIGARETTES.

(MESSRS. WIX AND SONS, LTD., 238–248, OLD-STREET, LONDON, E.C. 1.)

ON various occasions cigarettes have been placed on the market, the lip end of which is provided with some kind of filtering arrangement designed to hold back the moisture, pyridine, and solid particles resulting from the combustion of the tobacco. Such filters have had but little success, as they are found in some cases *to impart a flavour to the smoke or they take out too* much and render the smoke tasteless and devoid of character. Generally cigarettes are not smoked to the end, and the stump which is thrown away is about 15–18 mm. in length. This length acts as a filter during the time of smoking, and many of the products of combustion are retained therein. This length of *tobacco is lost to the smoker, while brands of cigarettes* with cardboard mouthpieces cannot be smoked with any pleasure right to the end as the last few draws possess a strong and unpleasant flavour.

The Savoy cigarettes are fitted with a "Styx" filter which, it is claimed, reproduces to a great extent the absorptive characteristics of a similar length of tobacco and shows a greater capacity for retaining the non-volatile particles that are not an asset to the aroma of the tobacco-smoke, and, moreover, are a source of irritation to the throat. No claim, however, is made for an increased retention of nicotine. When examined, the filter plugs are found to consist of three layers of crêped paper, which is not unduly absorptive. *The* paper is wound into *a* spiral, so that no central cavity remains through which a straight stream of smoke would impinge on the tongue. Between the layers of crêpe paper is a layer of cellulose fibre, which constitutes the true absorption medium. The crêpe paper and cellulose fibres are tasteless and odourless, and the end of the plug nearest to the tobacco is treated to render it non-imflammable. A further advantage of the filter plug is that no loose pieces of tobacco can enter the mouth.

We have carefully examined these cigarettes, and having submitted them to physical and chemical tests, we find that the claims described above are justified. The cigarettes, when smoked, are cool and notably less *irritating to the mucous* membrane than the same cigarettes without the "Styx" filter.

THE LANCET.

LONDON: SATURDAY, JULY 14, 1928.

THE RATING OF HOSPITALS.

HE answer to a question in Parliament can be erally correct without being particularly com- ing. Of this nature was Sir KINGSLEY WOOD'S y on the subject of the assessment of voluntary itals. A remarkable diversity of practice has n. At a meeting in Brighton, reported in THE CET last week, it was stated that in Sheffield the itals received special consideration, the assess- t working out at £1 per bed, whereas in Brighton Royal Alexandra Hospital for Sick Children assessed at £14 per bed. The sums demanded other Brighton institutions are alarming. From Royal Sussex County Hospital, which formerly £100 a year, £1600 is now asked; the Children's ital figure has jumped from £16 to £500, and the Hospital from £17 to £100.

e Ministry of Health can state correctly that the er lies not with the central but with the local ority, that the change is not germane to the rnment's new proposals for relief of agriculture industry, and that the hospitals have all their owers of appeal to quarter sessions against over- sment. It is equally true, however, that the tal's difficulties are a national phenomenon and ional concern, and that no hospital is in a hurry end several hundred pounds on lawyers and t witnesses in the uncertain enterprise of nging other experts' figures. If the present g policy involves the bankruptcy of the voluntary tals, the Ministry of Health must take one side e other. If there is no intention of overwhelming ospitals beneath the crushing weight of rating sments, incidents like the new Brighton demands be checked at once. This can be done either e specific declaration of Parliament in favour e exemption, or at any rate the special treatment, spitals; or else it can be done by the adminis- ve action of the local rate-payers who must ce their views upon assessment committees rating authorities. As a practical step, objection be taken to excessive hospital assessments and osals must be made for amendment of the list. e assessment committee can then be persuaded ve the hospitals special consideration, the rating ority and the individual rate-payer will never the hardihood to protest against the mitigation hospital's burden. In this respect the hospitals no different position by reason of the Rating f 1925. It may be admitted that, technically— s to the good sense of the community whose ts they serve—hospitals have in the past been assessed, and it was always possible for objec- be taken to the leniency with which they have reated. But the history of English rating e time of ELIZABETH has been that the local ker, being also the local rate-payer, has d in adjusting the burden to his own shoulders tanding the efforts of Parliament or other o interfere. There is no reason why rate- hould not spare hospitals if they want to. 5 Act has indirectly produced the present ause it has caused a general revaluation of property. Doubtless, in many cases, experts have been called in; the experts, probably paid by scale fees on final figures, have no incentive to maintain the traditional leniency towards hospitals. But the experts and the assessment committees, like the local and central authorities themselves, exist to observe the wishes of the community. There can be little doubt that it is the general wish that the work of the hospitals should not be hampered. This general wish must be made articulate and effective.

The London hospitals are not affected by this special problem as yet. The 1925 Act did not apply to London. Though this year's measures for relief of productive industry from rating burdens will touch the metropolis, the hands of the Minister of Health are, for the moment, too full for him to tackle the big task of reforming the system of London rating. London, however, cannot afford to be indifferent to the difficulties which arise elsewhere, if for no other reason than that her turn will surely come.

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SUPPURATION IN THE LOWER RESPIRATORY TRACT.

THORACIC surgery has already many victories to its credit, but in spite of technical progress the treatment of suppuration in the lower respiratory tract may still be very difficult. The same is true of the differential diagnosis, and two critical reviews,[1] by BORDET and SERGENT and by ARCHIBALD, bear witness as much to the need for care and caution as to the efficacy of the methods now available. Radiology has certainly extended our knowledge of the relationship of bronchial to pulmonary suppuration. It is clear that expectorated pus must have either a bronchial or an extra-bronchial origin, and a radiogram taken after the injection of lipiodol affords a clear picture of the condition of the bronchial tree, provided the tubes are patent. Suppuration due to bronchiectasis can thus be distinguished from that due to other causes. But the help to be gained from injection of lipiodol is limited by the fact that its flow may be obstructed, so that it fails to penetrate into a diseased area. An abscess may communicate with a bronchus, but if the fistulous connexion between the two is partially obstructed by granulation tissue, as is usual, the flow of the opaque oil will stop short at the entry. We may therefore divide into two groups those radiograms revealing shadows which suggest the existence of suppuration in lungs or pleura. In the first the injection of lipiodol proves the opacities to be due to bronchiectatic dilatations; these may or may not be complicated by inflammation of surrounding structures, but the primary lesion is in the tubes. The second group comprises the films with shadows which are not penetrated by lipiodol, and these may be due to suppuration within the lung or pleural cavity. Such shadows may be homogeneous or otherwise, the existence of an abscess cavity being suggested by an area in which a dense opacity surrounds a central clearer space. If such a cavity communicates with a bronchus and contains pus, the presence of a fluid level will demonstrate the condition on the film. This appearance may be due to pulmonary abscess, encysted pyo-pneumothorax, or a suppurating cyst. The diagnosis of a large pyo-pneumothorax seldom gives rise to difficulty, but if the collection of fluid is small, and especially if it is near a lung fissure, differentiation between intrapulmonary and extrapulmonary suppuration may be almost impossible. The relationship of the fluid to the parietes of the chest and to the pulmonary shadow may be of help for, as Bernou has pointed out, a characteristic of a localised empyema is that its inner border makes a sharp angle with the parietes. The relationships of a similar collection at the base of the lung may be determined by a radiogram taken when the patient is in the Trendelenburg position, which will reveal the relations of the costo-phrenic sinus. It should not be forgotten that pulmonary abscess is a relatively common condition, whereas a localised empyema is rare.[2] Interlobar empyema is characterised by a triangular shadow, and in the transverse position this slopes in a downward and forward direction. If the pus tracks into a bronchus the appearance of a cavity with a fluid level will be seen, indistinguishable from that of a similar cavity resulting from rupture of a pulmonary abscess. Perhaps the greatest difficulty is encountered when a shadow of more or less uniform opacity is seen, when lipiodol fails to enter the area implicated, and when no evidence of cavity can be detected. This may be due to abscess or to pleural effusion. A cloudy appearance which has been likened to smoke-puffs indicates the probability of an abscess with irregular prolongations in the lung.

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[1] Diagnostic radiologique des suppurations broncho-pleuro-pulmonaires chroniques: Emile Sergent et François Bordet. Le traitement chirurgical des suppurations pulmonaires: Edward Archibald, M.D. Arch. Med.-Chir. de l'Appar. Resp. 1927, ii., 393-413.

The treatment of chronic pulmonary suppuration is fraught with both difficulty and danger. As H. C. Ballon says, there can be no rule-of-thumb for dealing with an abscess of the lung, a bronchiectasis, or an encysted empyema as though each were a separate entity; for inflammation in the lower respiratory tract is apt to involve bronchi, pulmonary parenchyma, and pleura. The treatment of bronchiectasis depends upon the co-existence of complicating factors. If lipiodol reveals bronchial *dilatation*, and if there is no evidence of accompanying abscess formation, medical treatment by posture, vaccines, and attention to hygiene is indicated. In graver cases, when radiograms show that the process is extending or that ampullary dilatations make drainage by natural methods impossible, further measures must be taken. Ballon has treated 500 cases by direct aspiration, employing the bronchoscope for this purpose. Though cure can seldom be attained by this means, he claims a considerable measure of success in the alleviation of symptoms and improvement in health. He considers that bronchial lavage is dangerous and unnecessary, and though treatment of bronchiectasis by artificial pneumothorax may cause temporary improvement, it is followed by relapse as soon as the lung is allowed to re-expand. Phrenic evulsion seldom, if ever, leads to a satisfactory compression of the dilated tubes. Thoracoplasty holds out small prospect of permanent benefit and the operative mortality is high. To avoid the risks from shock C. A. Hedblom has devised "gradual thoracoplasty," the operation being carried out in from three to seven stages. Even with these precautions he avoids operating when cloudy shadows in the skiagram suggest that the bronchiectasis is complicated by pulmonary suppuration. Treatment which may demand seven operations, and is only applicable to uncomplicated forms of the disease, seems to have little to commend it. Lobectomy, following ligature of the bronchi and vessels of the diseased lobe, is more dangerous than thoracoplasty and no better in its results. A more hopeful method is that of E. A. Graham, who practises pneumectomy by cauterisation. After resection of portions of three or four ribs and the formation of adhesions to protect the healthy pleura, the diseased tissues are removed by the thermo-cautery. Several applications of the cautery may be necessary to remove all the diseased tissues, and a mortality of at least 20 per cent. may be expected after this comparatively safe procedure—a striking commentary on the dangers attending surgical interference in bronchiectasis.

The classical operation for chronic pulmonary abscess is pneumotomy and drainage, following rib resection and the formation of adhesions to protect the pleural cavity. Immediate improvement has been the rule, but closure of the wound has almost inevitably been followed by recurrence of symptoms and further pus formation. The cause of these disappointing results has been explained by the use of lipiodol. Bronchiectasis is a frequent complicating factor in pulmonary abscess, and it is useless to drain the abscess if neighbouring bronchi are dilated and harbouring pus. E. Archibald has abandoned simple lobectomy in favour of Graham's method of cautery pneumectomy. A more extensive rib resection than that practised in lobectomy is carried out and adhesions are provoked by packing with gauze. At a second operation the abscess is opened by means of the thermo-cautery and the cavity is packed. At a later date lipiodol is injected into the cavity and a radiogram is taken to ascertain if there are any residual bronchiectatic lesions or secondary abscesses. Any further destruction of diseased tissues is carried out by means of the electro-coagulating needle. Thus, while simple pneumotomy may suffice for the treatment of acute abscess or for a simple circumscribed abscess near the surface of the lung, pneumectomy by cautery is the operation of choice for the complicated or deep-seated forms. Lobectomy may be a more *radical operation* but, as Archibald remarks, a living man with a fistula is worth several dead men cured by lobectomy. The operative mortality for the latter operation is given as 57 per cent.

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DEAFNESS AND INDUSTRIAL DISABILITY.

Total deafness, or anything approaching total deafness, is a far more terrible affliction than is easily realised by the general public, but unlike blindness, it does not make an immediate and universal appeal to compassion. It is a familiar fact that a blind man instantly excites our pity, while a deaf one is somewhat annoying. The consequence is that, of all forms of charitable effort, the agencies which have long striven to help the deaf in this country are about the worst supported. The skilled assistance which can be given to the totally deaf will usually turn them rapidly into people who can be valued and self-supporting members of the community; but this assistance is by no means always forthcoming, and the standard of our care for the deaf is lower than for almost any other comparable class of afflicted people. Those who are deaf from birth, or become severely deaf at an early age, are also necessarily dumb. Of these it is reckoned that there are about 40,000 in Great Britain, but there are no satisfactory statistics to show the number—certainly far greater—of those who become so deaf later in life as seriously to interfere with their employment. For deaf children, up to the age of 16, local education authorities, and the Education Department, have been doing for many years extraordinarily good work. These children, however, when they leave the special schools, together with all who have become deaf in later life, are at a great disadvantage in finding employment. It is true that many agencies, mostly missionary societies, exist for the purpose of giving them help, but these have great difficulty in obtaining funds, and they are unable to assist more, at most, than half the deaf people who are in need of their services. Of those who have become deaf after childhood, men whose deafness was brought about by the war are dealt with by the Ministry of Pensions, and on the whole quite adequately; but for the far larger number who have become disabled in civil life there is virtually no help at all.

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[2] See THE LANCET, 1923, i., 1336.

All this was admirably stated a few weeks ago by Lord CHARNWOOD, who performed a notable service to deaf people by raising the question in the House of Lords, when he asked the Government to institute an inquiry. It is much to be regretted that Viscount GAGE, for the Government, was unable to accede even to this modest request, chiefly on the ground that, if machinery like that set up to deal with the blind is applied to all congenital affections, the Ministry will have a great financial load placed upon it. It is perhaps some consolation that this reply appeared to be unsatisfactory to his hearers; indeed, Viscount HALDANE raised the criticism that it had been prepared before the debate came on, and before anybody could know what was going to be said. It is a waste of money to teach deaf and dumb children, unless there is adequate machinery to assist in their employment when taught, and it is probable that Government assistance to the existing societies would prevent much of this waste at little cost. In any case, the inquiry asked for would cost little or nothing, and would do much good by stimulating public interest where it is sorely needed.

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PRESENTATION TO SIR GEORGE MAKINS.

ON Wednesday, June 20th, in the Governors' Hall at St. Thomas's Hospital, Sir George Makins was presented with his portrait, the gift of his friends, pupils, and colleagues. The painting is by Mr. James S. Sleator and is a sound piece of work. The proceedings, which were quite informal, were opened by Sir Arthur Stanley, treasurer of the hospital, with a few warmly appreciative words on behalf of the governors. He was followed by Sir Percy Sargent, Sir Cuthbert Wallace, and Dr. H. G. Turney, who as friends and colleagues of different periods dwelt in turn on the length and value of Sir George's services to the medical school and hospital, and on the affectionate regard in which he was held by all with whom he was associated. Special reference was made to Lady Makins who had taken so large a share in establishing and maintaining these kindly relationships. Sir George, in reply, expressed his profound appreciation of the honour done to him.

All the medical profession will unite in appreciation of the action taken by St. Thomas's Hospital, for Sir George Makins, though a great St. Thomas's man, is a representative of the best scientific and professional development which medicine throughout our country—and the world—has seen during the past half century. His work commenced when the verities of the Listerian teachings had been established, and he has been a leader in all the advances which followed—advances which, while they were most openly reflected at first in the enlarged scope of operative surgery, have since revolutionised the whole of medical work. How clearly throughout this onward march Sir George Makins has been recognised as a protagonist is shown by the high responsibilities which have at different times been laid upon him by his country and by his colleagues as man of science, practising surgeon, and wise administrator.

Annotations.

"*Ne quid nimis.*"

THE BRITISH MEDICAL ASSOCIATION'S ANNUAL MEETING.

FORTY-THREE years have elapsed since the British Medical Association last visited Cardiff, and the annual meeting which opens there in ten days' time will be the ninety-sixth in its history. Sir Ewan Maclean, the incoming President, will give his address on the evening of Tuesday, July 24th, and the scientific sections will meet, as usual, on the three days following. Their programme from year to year shows the gradual enlargement of the scope of medicine, and the task of selecting subjects grows ever more embarrassing. Nevertheless, the organisers have once again succeeded in arranging meetings that reflect many of the main tendencies of medicine—and especially clinical medicine—at the present time. While the physicians are to discuss diseases of the coronary arteries, the prevention and treatment of diphtheria, and the problem of acute nephritis, the Section of Surgery will consider such subjects as pancreatitis, the diagnosis and treatment of spinal cord tumours, the treatment of gangrene, the diagnosis of ureteric calculi, and (with the Section of Radiology) the fallacies of radiography in abdominal diagnosis. The vexed questions of unsuccessful forceps cases and sterility will again be raised at the Obstetrical Section, which will also hear papers on other topics, whilst the Section of Mental Diseases and Neurology will devote its attention to autotoxæmia in relation to the causation of psychoses, the differential diagnosis and treatment of cerebral states following head injuries, and the early treatment of psychoses and psychoneuroses. Of special interest at the present time will be the discussion at the Pathological Section on encephalitis occurring in the course of virus disease and the exanthemata, and another occasion of importance in connexion with vaccination will be the session devoted by the Section of Preventive Medicine to the value of present methods of controlling infectious diseases. Without reproducing the entire programme it is impossible to give a fair idea of the topics chosen for discussion, ranging as they do from the medical treatment of gastric disease to the decline of the birth-rate. Enough has been said, however, to show their catholicity and their appropriateness. The meetings will be held in the mornings, and will be interspersed with dinners, receptions, excursions, and other social events. As usual, the meeting of representatives of the Association will be held before the scientific sessions, and it will open on the morning of Friday, July 20th.

LITTLE FLEAS AND LESSER FLEAS.

THE aggregation of man into concentrated communities has produced most of the problems with which modern hygiene has been mainly concerned. In nature hosts and parasites have generally come to some sort of stable balance with "live and let live" as its motto. Of this we should know more if we understood the parasitology of wild animals better: trypanosomes in game in Africa and Gaertner's bacillus in rats at home are familiar examples. Similarly, when vegetable crops are grown over wide areas in more or less pure culture, special troubles with parasites generally arise. This is particularly apt to happen when the plant itself has been moved from its natural home; coffee, for example, and rubber and bananas and oranges are now grown all over the world where climatic conditions are appropriate. Along with this transportation of hosts there has been a dispersion of parasites, and out of the troubles that have come from upsetting the balance natural to any country has arisen an extraordinarily interesting chapter of biology. The parasites of a plant are, it seems, normally controlled and kept within bounds by a second series of parasites, and these again sometimes by a third. In the moth *Pyrausta nubilalis*, for instance, something of a pest to corn in Southern Europe and a serious injury in the United States since its introduction in 1910, 18 parasites (mostly insects) have been found to make their living on the larva, one on the egg, and two on the chrysalis.

If a parasite gains access to a new country without its own parasites it is obviously in a very advantageous position, of which it may make full and foul use, and similarly the multiplication of a host on an unprecedented scale may give parasites a chance to increase beyond the controlling powers of the secondary parasites. The plain remedy is to encourage or introduce the parasites of the parasite, and in a number of instances this plan has been put into operation with signal success. An Australian ladybird, for instance, has proved a perfect remedy for the cushion scale of oranges and lemons in California, Portugal, South Africa, Egypt, and elsewhere. A chalcid wasp from South Africa similarly controls the black scale insect in California, and the Italian silk industry has been saved from ruin by importing a parasite of the scale insect which destroys the mulberry trees. Plants which grow too profusely have in the same way been brought within bounds by importing insects which feed on the seeds. The problems involved are very complex, and Dr. W. R. Thompson, who works at the laboratory maintained at Hyères for the purpose by the United States Government, contributes a thoughtful survey of the ramifications of inter-relationships which are involved to the last number of *Parasitology* (1928, vol. xx., p. 90).

The general principles discussed are applicable to many problems of human hygiene, and the details have, of course, a very intimate bearing on the control of the insects which carry disease and of human parasitic worms. Some years ago an ingenious suggestion was made by Dr. B. S. Elgood and Major T. Cherry [1] that bilharziasis in Egypt might be controlled by encouraging the native population in the villages to keep ducks. The suggestion arose from the observation that the snail, which is the intermediate host of the bilharzia, is absent from those ponds and lakes to which ducks have free access, whereas they are abundant elsewhere. It would be interesting to learn whether this scheme was ever tried out. d'Herelle would have us believe that bacteria may be curbed by encouraging his *Protobius bacteriophagus*: it may be so. But it is certain that African sleeping sickness will ultimately be controlled only by finding out how the tsetse-fly lives and moves and has its being; by discovering its parasites and other difficulties and increasing them; and by ascertaining its favourite food and the conditions of life which it likes, and by destroying them.

THE INFLUENCE OF DIET ON HÆMOGLOBIN REGENERATION.

So sensational were the results of the application of the liver treatment to primary anæmia that a more or less universal disappointment was experienced when its effects in secondary anæmias were pronounced to be slight. In fact, the indefinite results in these cases as compared with the remarkable improvement induced in cases of primary anæmia led many observers rather hastily to conclude that liver is without effect in any type of anæmia other than the primary or Addisonian. Further experience has caused most of those who have investigated the matter to modify their views, and clinical experience is beginning to show that liver is not without beneficial effects even in the secondary anæmias. Prof. G. H. Whipple has been able to show that in experimental animals liver has indeed a powerful effect in inducing hæmoglobin regeneration in secondary anæmia. This effect is not confined to liver but is shared in lesser degree by many other foodstuffs. In the June issue of the *American Journal of the Medical Sciences* Prof. Whipple summarises the results of tests on various articles of diet carried out under his direction in the Department of Pathology of Rochester University. The experiments were made on dogs brought to a standard degree of anæmia by repeated bleedings, and they appear to have been subjected to rigid control. Of all the articles of diet tried beef liver produced the most rapid regeneration of hæmoglobin; second to this came beef kidney, and then chicken gizzard, the index of which works out at 85, compared with 100 for beef liver. Chicken liver had a powerful effect, but fish liver appeared incapable of producing the slightest regeneration of hæmoglobin. Prof. Whipple found various vegetable substances to be effective, though none of them to the same extent as mammalian tissue. Thus apricots, apples, raisins, and prunes all showed considerable power; raspberries were as inactive as fish liver. "The leafy vegetables," says Prof. Whipple, "have a reputation much better than they deserve. . . . We can furnish no evidence of unusual blood regeneration following liberal diets of various greens. Beet greens, spinach, asparagus, and lettuce all show values of between 5 and 20 g. hæmoglobin production per two week period above the control level," as opposed to 100 for beef liver. Iron in the form of ferric citrate was found to bring about a material increase in hæmoglobin formation but the response was improved by the addition of liver; it was possible to demonstrate a liver reaction superimposed upon an iron reaction. Prof. Whipple appears to have come to the conclusion that the favourable results produced in secondary anæmia by the exhibition of suitable dietary factors, of which liver is only one, is due not to the activity of any hormonic substance but simply to the supply of the building-stones in the form of suitable amino-acids necessary for the elaboration of hæmoglobin. That the hæmoglobin of the muscle may be called upon to a limited extent to supply deficiencies of the blood hæmoglobin is a further observation arising out of this work. It has been shown, however, by biological tests that the hæmoglobin molecules derived from different tissues are not identical. It is probable that muscle hæmoglobin must be completely broken down before it can be utilised for building up blood hæmoglobin. These experiments are likely to help in the elucidation of the biochemistry of the blood as well as in therapeutics, and we trust that they will be continued and extended.

ULCERATIVE COLITIS.

THE bacteriology of chronic ulcerative colitis still gives rise to lively controversy. In 1924 J. A. Bargen reported from the Mayo Clinic that he had found a Gram-positive diplococcus in 90 per cent. of cases, and vaccines prepared from the organisms have been used at the Clinic with apparent success in treatment of the condition. But although Bargen found that freshly isolated cultures of the diplococcus produced diarrhœa and ulceration of the colon in rabbits and dogs, other workers have not wholly accepted his organism as causal; M. Paulson, of Baltimore, for instance, has reproduced the disease with various strains of streptococci which appeared in diplococcal form when freshly isolated. E. MacNaughton,[1] of Montreal, now brings forward support for Bargen's view by reporting the association of a diplococcus with five cases of ulcerative colitis, one of these cases being especially interesting because the appendix was removed after ileostomy, and in its mucosa there was an unruptured abscess from which a pure growth of Gram-positive diplococci was obtained. The characters of Bargen's diplococcus are identical with those of the "enterococcus" which French bacteriologists have long regarded as pathogenic, causing enteritis in infants and adults, and some forms of meningitis, and appearing as a secondary invader in cases of tuberculosis and paratyphoid fever. This organism was prevalent in the "fæcal infection" of wounds sustained on the Flanders front and on Gallipoli in 1915. It seemed to be of low virulence, but gave rise to a chronic indolent inflammation on invading the damaged muscles. Accidental infection of operating surgeons and laboratory workers occurred several times; the cases were slow in evolution but resistant to treatment. After the inoculation of large doses of killed organisms as vaccines in healthy persons no immunity reactions could be demonstrated. This diplococcus may need to be watched for as a secondary invader, but the primary ætiological factor in chronic ulcerative colitis is, we feel, as yet undiscovered.

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[1] THE LANCET, 1919, ii., 636.

[1] Canad. Med. Assoc. Jour., 1928, xviii.; 568.

THE COW AND UNDULANT FEVER.

IN the Court of Public Health the cow frequently stands in the dock on the charge of conveying disease to man. On some counts she eventually secures an acquittal—for instance, as a sufferer from scarlet fever—while on others, and particularly tuberculosis, a fair but protracted trial has resulted in a verdict of guilty with extenuation as regards the amount of disease transmitted. Fresh diseases, however, continue to be laid to her charge; for example, the last few years have shown that food poisoning of the salmonella type may sometimes be traceable to bovine infection, members of this group of bacilli being excreted in the milk.

The most recent indictment is that the cow is a source of undulant fever in man, and this involves consideration of an interesting field of veterinary-medical pathology. Malta fever, or undulant fever as it is now more generally called, was shown by Bruce in 1887 to be due to an organism called by him *Micrococcus melitensis*. Its relationship to infected goats and goat's milk was subsequently established. About 1897 Bang in Denmark showed that a bacillus named by him *Bacillus abortus* was the causal organism of contagious abortion in cattle. For many years no relationship between the two organisms was even suspected, and it was only after a further decade that comparison of the two types showed their extremely close agreement. This comparison was made by Miss A. C. Evans, of Washington, who further showed that infection with the organism of Malta fever tends to produce abortion in goats, whilst in later experiments she found that inoculation of cows with strains from human cases of Malta fever results in abortion. These findings have been confirmed and amplified by a number of other observers. In a further report in 1923, after a study of many types, she finds that strains of the *melitensis-abortus* group isolated from five species of animals fall into two distinct serological types which are closely related. One type, which may be called the *abortus* type, is characteristically bovine and porcine: the other, which may be called the *melitensis* type, is characteristically human and caprine. The types are not, however, restricted to special host species. The general opinion which is gaining ground is that *melitensis* and *abortus* are not distinct bacteriological species, but merely distinct serological types of the same species. *B. abortus* is not uncommon in England, and Wilson and Nutt in 1926 have recorded its presence in cow's milk in this country. In a recent paper Dr. P. Manson-Bahr[1] gives a summary of four sporadic cases of undulant fever in this country, most of which were not explicable on the grounds of infection with goat's milk. In addition he gives particulars of two further cases of his own, both of which were probably due to infection through cow's milk. He suggests that other cases might be found by closer observation of districts where bovine abortion is endemic.

At the last meeting of the permanent committee of the Office International d'Hygiène Publique it was reported that work in Sweden and Denmark had confirmed the view that *B. abortus* is the causative agent of undulant fever, and it was stated that this infection, "propagated by milk or cattle, is shown to be more frequent in the latter country than typhoid and paratyphoid fever." A good many obscurities remain, however, which can only be cleared up by further investigations. For example, a considerable percentage of sera from persons not suffering from disease give a serological reaction with *B. abortus* antigen. The significance of this has not been established. Contagious abortion in cows is common in certain areas while human infections are probably rare. This may be because in infected cows *B. abortus* is only present in quite small numbers in the milk, or it may be a question of low virulence to man. The general position may be summed up by saying that the evidence goes to show that there is a risk of undulant fever being transmitted through drinking raw infected cow's milk, but as yet insufficient data are available to measure the extent of that risk or even to show if it is more than remote.

THE NEW ZEALAND HOSPITAL SYSTEM.

BY way of an appendix to its annual report the New Zealand Department of Health has issued an elaborate survey of the hospital system of the Dominion, called forth mainly by the recent considerable increase in expenditure. The New Zealand hospitals are maintained partly out of the rates, partly by Government subsidies, and, to a much smaller extent, by voluntary contributions, which relieve the rates but not the taxes. Notwithstanding that help, even in comparatively slender degree, is derived from private sources, the document adopts a rather scornful attitude towards the voluntary system, which it describes as based upon "sentimental appeals." The Health Department is satisfied that the hospital arrangements of the Dominions are "unique," and that no real improvement in the financial method of maintenance has yet been proposed. In one respect, however, something less than perfection has been attained. "The only fault in the hospital system of New Zealand arises out of the number of hospital districts," and it is recognised that it is desirable to have thoroughly equipped modern hospitals serving larger districts, although the cost of even one such institution in each of the 47 districts would be prohibitive. Therefore, not only must no new districts be created, but existing ones must be amalgamated, a process which is greatly hampered by "selfish and parochial" opposition. Even under the system which is thus admitted to be imperfect, the cost of the hospitals has gone up by 150 per cent. in the last ten years, for much the same reasons that have operated in England. There has been a notable increase in the number of beds, which have grown from 5929 in 1923 to 7060 in 1927. The explanation of this expansion is that in New Zealand, as elsewhere, a greater proportion of the population is using the hospitals. This tendency of all classes to resort to the hospitals is held to show that there is no real need for the provision of private wards, though the Department of Health would be willing to see at least one hospital try the experiment. In one respect the New Zealand hospitals differ materially from those in the Motherland. In the Dominion the out-patients are fewer, in proportion, than the in-patients; there is, however, a tendency to develop the out-patient departments of the general hospitals. Upon the difficult question of the payment of medical staffs the Survey is emphatic. The Director-General of the Department is definitely of opinion that "the time has come for the abolition of the honorary staff," and he lays it down that "the honorary system is only suitable for hospitals treating only pauper patients." Neither the New Zealand branch of the British Medical Association nor the Dominion's Hospital Boards Association has expressed quite so sweeping a view, and so far no action has been taken.

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[1] Abhandlungen aus dem Gebiete der Auslandskunde, Hamburgische Universität, Bd. 26, D, Medizin Bd. 2.

THE TREATMENT OF ILEUS BY SPLANCHNIC ANÆSTHESIA.

ACUTE ileus, whether due to some mechanical obstruction, to atony, or to spasticity of the intestinal musculature, is one of the complications most dreaded by the surgeon. Numerous methods of treatment have been tried, both operative and therapeutic, and have recently been reviewed in our columns[1] by Mr. A. H. Southam. In a certain percentage of cases enterostomy is successful, but sometimes neither fæcal matter nor gas is discharged through the enterostomy opening and no relief of symptoms ensues. The suggestion that ileus might be satisfactorily treated by blocking the splanchnic nerves has recently been made by A. Ochsner, L. M. Gage, and R. A. Cutting,[2] as a result of a series of carefully conducted experiments on animals. The suggestion has a sound theoretical basis. Bayliss and Starling showed that physiological ileus could be abolished by resection of the splanchnics, and P. Rosenstein and H. Kohler found that procaine hydrochloride solution introduced into the splanchnic area of rabbits produced peristalsis. In those cases of paralytic ileus which are due to the inhibition of intestinal mobility from impulses passing by way of the sympathetics, the blocking of the reflex arc should abolish the inhibition. This mechanism accounts for the good results obtained by continental surgeons from the use of spinal anæsthesia. The procedure is not, of course, applicable to cases of mechanical obstruction where, in the early stages, there is no interference with the contractibility of the intestinal musculature. In any case spinal anæsthesia is not without its dangers. Splanchnic anæsthesia appears to be a safer procedure. Ochsner and his co-workers adopted the method devised by M. Kappis, using a 1 per cent. solution of procaine hydrochloride injected into each side at the lower border of the twelfth rib. Their experiments showed that splanchnic anæsthesia will produce peristalsis in physiological, chemical, and mechanical ileus in dogs, and there seems no reason why it should not be applied clinically to cases of paralytic ileus following operation, or to those which arose from mechanical obstruction, but do not clear up when the obstruction is relieved. Even when enterostomy has been performed, splanchnic anæsthesia might be valuable when toxæmia persists owing to the continued paralysis of the musculature and the inability of the intestine to expel its contents. The advantage of the Kappis method is that the abdomen need not be opened, the splanchnic area being approached through the retroperitoneal space and not through the peritoneal cavity. Reports as to the results of clinical trial of this method will be awaited with interest.

THE TAXING OF KNOWLEDGE.

Captain Ian Fraser's attempt to introduce into the Finance Bill a clause exempting scientific films from import duty met with the blankest *non possumus* from the Financial Secretary to the Treasury and only a faint hope was held out by the Chancellor of the Exchequer. The answer of officialism is that exemption would be "difficult and indeed almost impossible to administer." For ourselves we entirely decline to believe that it is beyond the power of expert draftsmen to frame, or of sensible civil servants to operate, a clause exempting films which are wholly educational in character. Exactly the same discrimination is applied elsewhere in connexion with the entertainments duty, and there is not the slightest reason why, as Captain Fraser suggested, the customs officials should not be satisfied with the certificate of the Royal Society, the British Medical Association, the Royal Astronomical Society, or other accredited body of the same sort. The Privy Council Committee for Scientific and Industrial Research seems a suitable organisation for the purpose. Nor need the proposed exemption cause a multiplication of officials; the country is evidently well equipped with personnel. Prof. H. H. Turner recounted, in a letter published in the *Times* of July 3rd, the experiences of a distinguished American astronomer who came over to lecture to the Royal Astronomical Society on the atmospheres of the planets and who brought with him two cinematograph films of the successive phases of Jupiter. He produced the films from his luggage at Victoria Station, explaining their nature and purpose. The films were impounded. Help was sought, says Prof. Turner, from the Royal Observatory, and the customs officer was assured of the integrity of the lecturer and his scientific purpose. Next morning Mr. A (the officer thus assured) introduced the lecturer to Mr. B in an adjoining office, who gave him papers to be carried to Mr. C elsewhere, who arranged for a meeting with Mr. D in the afternoon, as the result of which an order was made for removal of the films to the Bonded Film Stores in Endell-street. There the lecturer explained the situation to Mr. E, who introduced him to Mr. F, who sent him back to Mr. C, who referred him to Mr. G, who gave him an order on Mr. F for delivery of the films at Endell-street, on payment of duty. This occupied two days; part of the third day was devoted to official arrangements for return of one of the films (a reserve film) to America; the total expenses were about £4, including a fine of 2s. 6d. for the alleged offence of carrying "merchandise" in a trunk. What the distinguished American astronomer may have thought at this British adaptation of Ellis Island procedure—for fear a little scientific knowledge should creep into this country untaxed—is not recorded. What the opinion of the English public will be we would venture to guess. The use of the cinematograph in revealing to the medical profession the latest results of foreign research needs no emphasis. The Exchequer and the customs officials are the country's servants and not its masters. They must find some means of doing even what is "difficult and indeed almost impossible."

OXFORD OPHTHALMOLOGICAL CONGRESS.

THE eighteenth annual meeting of the Ophthalmological Congress, held last week at Oxford, was attended by about a hundred members. On Thursday Dr. Leonard Hill opened a symposium on ultraviolet rays, dealing principally with the physics of the subject. In disease, he said, the beneficial action of the rays depended upon appropriate dosage, too large doses being liable to do harm. Healthy subjects, on the other hand, were subject to comparatively little risk. How the beneficial effect is produced remains to a great extent a mystery. It has, however, been definitely proved that one effect is to increase the bactericidal action of the blood and further, that minute amounts of ergosterol are activated by the rays to produce vitamin D. Dr. N. S. Lucas gave his experience at the Zoo and at the Lister Institute where the rays have been proved to be curative for rickets in monkeys. As to their application to ophthalmic therapy not much was said. Friday's programme included a paper by Mr. Burden Cooper on the spectroscopy of the crystalline lens. The ash shows traces of various metals, and it may be significant that there is considerably more calcium in the ash of cataractous lenses than in that of normal ones. A discussion on sympathetic ophthalmia was opened by Mr. Harrison Butler. Recent advances are in the direction of diagnosing the disease in the exciting eye before the sympathising eye has become affected, the main points of interest being how far the differential blood count is a valuable diagnostic sign and how far the evidence of the slit-lamp is of practical service in diagnosis. Mr. Harrison Butler had not found the former of much service and relied chiefly on the latter. Mr. S. H. Browning and Mr. M. Hepburn joined in the discussion. The latter recalled his paper on the subject read to this congress in 1926 and stated that in possible cases of sympathetic disease he always had a blood count taken, and if it were positive began the injection of arsenical compounds at once. The discussion was followed by the delivery of the Doyne Memorial Lecture by Prof. Arthur Thomson, whose subject was "Observations on the Eyes of Birds" and his main thesis a theory of the function of the pecten, a structure which has been a mystery to anatomists for 250 years. The theory is that the pecten, being a deeply pigmented body and being lined with a thin hyaloid membrane, acts as a dark mirror, reflecting objects from a direction other than that of the bird's flight on to the retina, and avoiding dazzle. The suggestion was made that it acts as a sort of periscope, causing the bird in its flight to be aware of any bird of prey hovering above him in the sky. The demonstrations included an ingenious apparatus for educating the amblyopic eye of young children by Mr. E. Maddox, a selection of Hamblin's fundus drawings demonstrated by Mr. Rayner Batten, different applications of the duochrome principle to refraction and other ends. Lighter items of the programme included a garden party, at which Prof. and Mrs. R. A. Peters, of Trinity College, were hosts, the annual dinner at which Sir Farquhar Buzzard, the new Regius Professor of Medicine, was the chief guest, an excursion to the Morris Motor Works, and the inevitable photograph.

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[1] THE LANCET, 1928, i., 41.

[2] Jour. Amer. Med. Assoc., June 9th, p. 1847.

THE ALCOHOL PROBLEM.

THE effect on the sobriety of the nation of the restrictions on the production and sale of alcoholic liquors during the war was discussed by Dr. H. M. Vernon in an address delivered to the Society for the Study of Inebriety on July 10th. According to him the most important feature of the control was the regulation of the hours of sale. When no liquor could be obtained before mid-day or between 2.30 to 6 P.M., it was, for the most part, taken only with food and was thereby rendered much less harmful. The arguments in favour of the limitation of the hours during which public-houses are open and of the taxation of wines and spirits, according to their concentration, are well set out in Dr. Vernon's recent book,[1] which we commend to anyone who wants to know what has been achieved and to reflect how further progress may be made. It is a plain, easy, straightforward account of the physiological effects of alcohol and of the various systems of regulation and prohibition which different countries have tried, with their results, including the improved public-house. Dr. Vernon is an experimentalist and with the aid of numerous tables and diagrams he appeals continually to experience: the efficacy of the operations of the Liquor Control Board is measured in the same spirit as that which moves him to determine how much whisky of what strength he must drink before he can no longer work a typewriter. He probably has some general prejudices on the subject, but he keeps them out of sight as much as any man may, and it is only because he tells us so that we know he is one of those really moderate drinkers who are the despair of the ardent teetotaler. Of complete prohibition as a practical proposition for to-day he thinks poorly, and he attaches much more importance to control based on the physiological facts, ascertained by experiment, that alcohol is less intoxicating if it is taken when the stomach contains food and if it is well diluted. He advocates, therefore, a stringent pursuit of the plan at present prevailing in this country of making alcohol easily available only round about meal times and, by differential taxation, making concentrated alcohol more expensive than dilute. He would indeed exaggerate the difference by cheapening beer which contains as little as 3 per cent. of alcohol on which it is almost impossible for anyone of a normal capacity to get drunk.

THE PROGRESS OF DERMATOLOGY.

THE May number of *American Medicine* is consecrated to dermatology, and among a heterogeneous collection of original papers is one by Dr. E. L. McEwen, of Chicago, which admirably assesses the progress of the last ten years and helps to clarify the subject for practitioners, to whom the thesis is addressed. "What does the general practitioner see in dermatology?" asks Dr. McEwen. "He sees a jungle, to him more or less impenetrable, with trails that are poorly blazed, devious, full of pitfalls, and leading more often to denser thickets than to open spaces." The metaphor could hardly be better chosen, for there is no branch of medicine in which progress has been more sudden. Before the discovery of the spirochæte there was an increasing tendency towards portentous nomenclature, serving chiefly as a ragged veil to ignorance. With the solution of many ætiological problems, among which may be mentioned the tuberculides and eczematoid ringworm, and the recognition of the importance of focal sepsis and allergy in cutaneous manifestations, the veil is lifting, and if progress is maintained at the same rate it is reasonable to hope that before long we may be in a position to throw light on psoriasis, pemphigus and mycosis fungoides. The elucidation of the problem of eczema is well under way, and Dr. McEwen accepts the differentiation of dermatitis as opposed to eczema by relegating to the former all cases that are clearly of external causation, or "nearly so," classing in the eczematous those cases whose cause is suspected of being purely internal. He draws attention to the reduced likelihood of any given eruption being syphilis, which a generation ago had a statistical frequency of over 11 per cent., and was second only to eczema among dermatological diagnoses. In this branch of medicine the introduction of various chemotherapeutic remedies, such as salvarsan and the X rays, radium and ultra-violet rays, have greatly strengthened our hands of late years, and the journal under review bears witness to a new and hopeful outlook.

DEATH OF DR. POTTEVIN.

MEDICINE in its broadest sense has lost a good friend by the death on July 6th of Dr. Henri Pottevin, Director of the Office International d'Hygiène Publique. He had a cerebral hæmorrhage shortly after the May session of the Permanent Committee and a second last week which proved rapidly fatal. Effective international health work has many difficulties, but as far as the Office International was concerned these were surmounted by the ardent, quick-brained Frenchman of the Midi who had a positive genius for consolidating and interpreting the contributions and opinions of men from other countries and of combining them, wherever it could be done, into logical statements and agreements. Henri Pottevin was in his sixty-third year, a doctor of medicine and science, a collaborator of Pasteur in his early days, and always in touch with the Pasteur Institute. He was director of the health office of the town and port of Havre for some years, and was appointed general secretary of the Office International from the date of its foundation in 1907, succeeding Cazotte as Director in 1926. He had many other activities, notably as a Professor in the Conservatoire des Arts et Métiers in Paris, and he had an active political life which led to his being appointed a Senator of his native department, Tarn et Garonne. He left the Senate only last year. From the British point of view he will perhaps best be remembered in connexion with the various official conferences at which the successive international sanitary conventions relating to infectious disease and quarantine were concluded. In that of 1912 he was rapporteur for all technical questions, and in the recent conference of 1926 he was rapporteur général and, in point of fact, the management and satisfactory conclusion of that international instrument could never have been achieved without him. Much had been hoped from his appointment, immediately after that conference, as director of the Office International, especially since he had seen this organisation grow from being representative of a small number of countries to one to which practically every Government now officially adheres, and whose Permanent Committee accepts the additional responsibility of advising the Health Organisation of the League of Nations. He will be remembered gratefully by those who, towards the end of the late war, used to attend the Inter-Allied Sanitary conferences for comparison of data regarding the prevention of disease in the different allied forces.

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[1] The Alcohol Problem. By H. M. Vernon. London: Baillière, Tindall and Cox. 1928. Pp. 252. 9s.

THE International Cancer Conference meets in London from July 16th to 20th. Delegates from nearly every important medical school and university in the world will attend its scientific meetings, which are to be held at the houses of the Royal Society of Medicine and of the College of Nursing. Owing to the limited space only a small number of tickets of admission are available, for which application should be made to the Secretary of the Conference, at the Royal Society of Medicine, 1, Wimpole-street, London, W. 1.

Sir Robert Philip, Professor of Tuberculosis in the University of Edinburgh and President of the British Medical Association, has been awarded the Trudeau Medal of the American National Tuberculosis Association. This medal is given annually to the person who has made the most meritorious contribution to the knowledge of the cause, prevention, and treatment of tuberculosis.

ROYAL SANITARY INSTITUTE.

ANNUAL CONGRESS.

THE thirty-ninth congress of the Royal Sanitary Institute will be held at Plymouth in the Guildhall and Council Chamber by invitation of the municipal authorities during the week ending July 21st. Delegates have been appointed by the principal Government departments dealing with health and sanitation, while all parts of Great Britain will be represented by sanitary authorities, societies, and universities. Representatives from our dependencies, from the United States, and the principal countries of Europe will also be present. The reception room will be opened in the St. Andrew's Abbey Hall at noon on Saturday, July 14th, and on the following day, Sunday, there will be a service at St. Andrew's Church in the morning and one at the George-street Baptist Chapel in the evening. Following the reception of members and delegates by the Mayor, there will be a public luncheon in the Royal Hotel, at 1 P.M. on Monday, July 16th; the opening of the Health Exhibit will take place in the Drill Hall in the afternoon, and the inaugural address will be given by Viscount Astor, the President of the Congress, in the Guildhall, at 5 P.M. The work of the sections will be spread over the following. Tuesday, Wednesday, Thursday, and Friday, the Presidents being: Preventive Medicine, Dr. L. Rajchman, Medical Director and Secretary of Health Committee of the League of Nations; Maternity and Child Welfare, including School Hygiene, the Viscountess Astor, M.P.; Personal and Domestic Hygiene, the Mayoress of Plymouth; Hygiene of Food, the Prime Warden of the Worshipful Company of Fishmongers; Hygiene in Industry, the Rt. Hon. Ramsay MacDonald, M.P. Other sections include veterinary hygiene, engineering, and architecture, and there will be conferences by representatives of port sanitary authorities and National Health Insurance societies as well as of medical officers of health and health visitors. Among the large number of important subjects to be discussed are: tuberculosis, scarlet fever and measles, puerperal fever, fœtal mortality and injuries, the rheumatic child, the influence of environment on the mental health of the child, factory conditions, cremation, housing, and humane methods of cattle slaughter. A popular lecture will be delivered on the evening of Friday by Prof. W. E. Dixon, of the Pharmacological Laboratories, Cambridge, the subject being Poisoning in Daily Life. Both on Friday and on Saturday there will be excursions to various places of interest in connexion with health and sanitation. The offices of the Institute are at 90, Buckingham Palace-road, London, S.W., and the local offices are at the Town Hall, Stonehouse, Plymouth.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCLXXXIV.—TREATMENT OF MIGRAINE.

MIGRAINE may be defined as a periodically recurring nervous disturbance of which the essential element is headache. But in its classical form it presents a much more complex syndrome; the headache is usually unilateral, and in at least half the cases is preceded by symptoms indicating disorder in localised portions of the cerebral cortex of the side on which the headache is situated; the headache is accompanied by nausea, and after a number of hours vomiting occurs, and this ushers in the last stage of the attack which typically comes to an end in sleep. This symptom-complex is frequently accompanied by a slight mental change and most commonly this takes the form of irritability and depression. The symptoms of localised cerebral disturbance are usually of a sensory nature; hemianopia is the commonest and with it often go scintillating spectra in the dim half of the field; next in frequency come paræsthesiæ in one side of the face and tongue and in the corresponding hand and arm, while auditory disturbances, vertigo, and slight aphasia are not very uncommon. Motor disturbances in migraine are extremely rare, and apart from vague ephemeral pareses of the fingers the only kind of paralysis that is encountered is a palsy of one or more of the oculo-motor nerves. The occurrence of such a palsy during a migraine attack constitutes the so-called ophthalmoplegic migraine. It is only in very rare cases that this complication occurs, but when it does the patients may suffer from it with many of their attacks; the paralysis lasts a few days or even weeks, and diminishes gradually only to be renewed with the next paroxysm. Another atypical form of migraine results from a variation in the quality and perhaps also in the site of the pain, so that instead of being a unilateral headache it becomes a neuralgia in the cheek or temple.

Ætiology and Diagnosis.

Migraine is often hereditary; in a large number of cases it comes on at or before puberty, and in 80–90 per cent. of cases it has begun by the time the subject has reached the age of 25. Many sufferers have their own convictions in regard to its causation, but these views are very divergent, and it must be admitted that we simply do not know the cause or nature of this ailment. There is, however, almost a consensus of opinion that it arises in some way from a functional disorder of the vegetative nervous system; this view accounts for the close association between the onset of attacks and disorders of the alimentary canal, while the pallor of most of the patients during their attacks certainly indicates that the vaso-motor system is involved. If this theory is correct the action on the cerebral cortex whereby the sensory symptoms are produced must be a very indirect one, since the cortical blood-vessels are devoid of vaso-motor nerves. Another theory is that the foramen of Munro on one side becomes blocked and that the cerebral symptoms are a consequence of the distension of the hemisphere that results from the continued secretion of cerebro-spinal fluid into the closed lateral ventricle. Some writers, notably F. G. Crookshank, have regarded migraine as a psycho-neurosis, but this suggestion has not found wide acceptance, and it seems inadequate to account for such a symptom as ophthalmoplegia.

The sensory accompaniments distinguish migraine from other forms of headache, and if they are absent its unilateral distribution and the paroxysmal nature and definite course of the attack usually make its nature apparent. The headache of cerebral tumour or intracranial syphilis is almost always more general, and the patient rarely has such intervals of absolute freedom. A commencing occipital lobe tumour may give rise to attacks of headache with hemianopia and scintillations. but the sudden onset and abrupt cessation of these attacks is unlike the course of migraine. and eventually a convulsive seizure or the onset of papillœdema may make the diagnosis clear. Similar symptoms may occur in certain cases of epilepsy. and here, as in cases of tumour, the occurrence of a fit may show that the ailment is not migraine. The onset of an ocular paralysis in a case of supposed migraine calls for the most careful revision of the diagnosis and a thorough examination of the nervous system, for ophthalmoplegic migraine is a rare condition and the causes of headaches with ophthalmoplegia are many; migrainous neuralgia is commonly mistaken for tic douloureux, but it is not brought on by washing the face, nor by eating or talking; moreover. the pain is less intense and has a less precise distribution: migrainous neuralgia is accompanied by nausea and occurs in subjects who have previously suffered from more typical migraine.

Treatment between the Attacks.

The more specific treatment involves: (1) the use of drugs acting on the vegetative nervous system, (2) general nervous sedatives, and (3) the correction of ocular refractive errors; general measures are also of great importance.

Of the drugs which act on the vegetative nervous system those most in vogue are nitroglycerine and thyroid; calcium lactate has also been credited with good results. Nitroglycerine is best given in the form of liquor trinitrini. of which doses of ½–1 minim are to be taken in acid solution three times a day; it may also be given in the chocolate tablets (each = gr. 1/100), half a tablet or a whole tablet being taken thrice daily. The administration of these doses is to be continued over long periods except during the actual migraine attacks when it should be stopped. Nitroglycerine was extensively used by Gowers, and is still the most widely efficacious remedy; some patients obtain complete relief from it alone. Thyroid, unless there is any indication of thyroid deficiency. is sufficiently exhibited in a dose of grs. 2 of the dry extract taken at bed-time; it probably acts as a general metabolic stimulant. Of the drugs regarded as general nervous sedatives luminal is undoubtedly the best; gr. 1–1½ at night or gr. 1 night and morning. is sufficient. It is best given in tablet because it has a low solubility, and because the soluble compound (with sodium) is not nearly so efficacious. With the less severe types of migraine great reduction in the frequency and severity of the attacks may be obtained from luminal and thyroid without recourse to liquor trinitrini. Bromides are in frequent use and are often combined with salicylates.

The degree to which ocular trouble can be held responsible for migraine is a matter of controversy, but there is no dispute that the sufferers are mostly educated people who read a considerable amount and in whom consequently any astigmatism. heterophoria, or muscle imbalance is likely to be the source of a particular fatigue. It is therefore essential that at the very outset of treatment such conditions should be carefully tested for and, as far as possible, compensated. Gross refractive errors play less part in practice, since among such patients they have nearly always received attention at an early age.

General Measures.

The frequency of attacks is so much affected by the patient's general health that no possible adverse influence can be neglected. The condition of the bowel is naturally the first care. Any tendency to constipation must be effectively treated. and even though constipation be not present benefit is derived from a morning saline. A minute dose of magnesium (or potassium) sulphate, not sufficient in quantity to produce any unpleasant action on the bowel, is perhaps the most efficacious, but *one of the* more palatable effervescent salines may often be substituted. Even a glass of water taken regularly in the morning is helpful. One of the mildly aperient spa waters may be drunk in quantity before meals throughout the day, and in severe cases a course of treatment at a spa is to be recommended. When an attack is thought to be imminent a prompt measure is indicated. such as an effective dose of calomel or a Seidlitz powder. Late hours, stuffy rooms, and fatigue are to be avoided. and sufficient exercise and fresh air must be obtained. The tonic effect of a holiday may procure an unwonted period of freedom; many patients find that unless they have a game of golf regularly at the week-end their headaches increase in frequency and severity, and probably in such cases the exhilaration of the game and its surroundings count at least as much as the exercise. In women anæmia and dysmenorrhœa require careful attention, for the migrainous subject rarely endures a painful menstrual period without an attack. Local infection in the tonsils or in the appendix should be thoroughly treated, and any obstructive trouble in the nose rectified.

The *diet* should be plain: very many patients regard factors in their food as a precipitating cause of their headaches and are aware of the particular circumstances that induce their attacks. It may be an excess of sugar, or an excess of protein, or purin-containing dishes or condiments or alcohol, or almost any single article of food; such causes vary widely from patient to patient, and consequently it is necessary to treat each case individually. In general, the experience of one patient in regard to diet meets with very restricted success when applied to the treatment of another. The limitation of diet is a measure to be applied in moderation, and only one kind of restriction should be enforced at a time; unless the patient's experience gives some other indication the abolition of sweetmeats should be the first to be tried. In considering the influence of such restrictions it must be remembered that the placing of a veto on any single article of diet has the effect of making the patient more careful in regard to his diet as a whole, and consequently benefit may ensue which is not a specific result of the prescribed limitation.

In short, in dealing with migraine, the rule is to review minutely with each patient his diet, conditions of work, and general mode of life, and to endeavour to discover and correct any circumstances by which headache is likely to be induced.

The Attack.

The attack of migraine, once established, is difficult to dispel. If there are prodromal symptoms which the patient recognises the attack may in some cases be aborted or greatly reduced in severity by a dose of calomel or a Seidlitz powder and full doses of aspirin, or one of its congeners, every 2–3 hours. In addition to official remedies there are many analgesics, mostly of the coal-tar group, on the market (e.g., veramon, arcanol, migranin, analgit). Most of them are of value and a patient may find a particular combination which suits him better than the others. These palliatives enable many patients to continue work during the attacks. One of the features of migraine is a peculiar irritability of the sensory systems and all who suffer from the more severe forms go to bed and endeavour to shut out light and noise and to have absolute rest. Some ask only to be left alone, and certainly the first rule is not to disturb the patient with much treatment. The analgesics mentioned may bring a little relief; some patients take strong coffee in addition. some like a compress on the forehead. Little can be done to hasten the climax of the nausea, but when this is reached and vomiting is achieved, sleep usually follows without difficulty. Occasionally chloral or veronal may be required. and in rare cases morphia is used to induce sleep and to enable the patient to retain nourishment in a long-lasting attack.

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Special Articles.

CONCERNING THE PROBLEM OF MOUNT EVEREST.

By J. ARGYLL CAMPBELL, M.D., D.Sc. Edin.

(From the National Institute for Medical Research, Hampstead.)

During the expeditions to Mount Everest in 1922 and 1924 it was proved that man can climb, although with difficulty, at an altitude of about 28,000 feet.[1] Norton, Somervell, Mallory, and Irvine reached this height. In addition it was proved that man can live, for some days at least, at altitudes above 23,000 feet (oxygen pressure = 9·5 per cent. atmosphere); several of the climbers spent three or four days above this level, whilst Odell spent ten days at 23,000 feet. Somervell, Norton, Mallory, and Irvine slept for one night at about 26,800 feet. Nevertheless, the exhaustion produced by climbing at 28,000 feet is described as fearful, and progress is very slow indeed. Mallory and Irvine lost their lives whilst climbing somewhere above 28,000 feet. It is possible that they were near the summit, 29,000 feet, where the oxygen pressure in the air is only about 7½ per cent. of an atmosphere. It has yet to be proved whether man can climb at this altitude. In recent experiments with animals [2 3 4] I have proved that some mammals—rabbits, rats, and mice—can live for at least seven days under continuous exposure to oxygen pressure at 7½ per cent. of an atmosphere. The animals were resting at normal temperature (15°–20° C.) and were not exposed to the rigors of chilling winds and very low temperatures, such as the climbers experienced. The outline of one of these experiments is given in Table I.

Table I.

Thirty animals in Messrs. Siebe Gorman's decompression chamber: 6 rabbits, 6 guinea-pigs (g.-pigs), 6 rats, 12 mice. *T. = 15°–20° C.*

Barometer mm. Hg.	Av. O_2 pressure in inspired air.		Approx. altitude corresponding to O_2 pressure.	*Deaths.*	*Duration in* days.
	mm. Hg.	Atmosphere.			
		Per cent.	Feet.		
600	116	16·6	7,000	—	3
440	85	12·1	15,000	2 mice.	7
400	77	11·0	18,000	—	1
375	72	10·3	20,000	6 mice.	6
320	62	8·8	25,000	1 mouse, *6 g.-pigs.*	7
290	56	8·0	27,500	—	1
260	50	7·1	30,000	1 rabbit, 1 mouse.	8

Average loss of weight of survivors = 23·1 per cent.[3]

The animals—6 rabbits, 6 guinea-pigs, 6 rats, and 12 mice—were exposed in a decompression chamber to gradually decreasing oxygen pressure such as might be experienced during a gradual ascent of the mountain. The animals thus had about four weeks to become acclimatised to low oxygen pressure before they were exposed to the lowest pressure (7½ per cent.) equivalent to that at the summit. Of the 30 animals under investigation, only 13—5 rabbits, 6 rats, and 2 mice—survived the experiment and, although they were obviously deteriorating rapidly, they gradually regained normal vigour when again under normal oxygen pressure.

In another experiment 50 normal mice were exposed to low oxygen pressure for 53 days, and on 14 of these days the oxygen pressure was as low as that on the summit of Mount Everest. The barometric pressure was kept about normal in this case; the special closed chamber used has been described elsewhere.[2 3] This experiment was really part of the control for another research to detect the effects of low oxygen pressure on cancer growth in rats and mice; the results for cancer were given in another communication to The Lancet (April 28th, 1928, p. 828). Of the 50 normal mice tested, 21 died (see Table II.) under the effects of the low oxygen pressure and the others were killed for histological examination.

Table II.

Fifty mice exposed to low oxygen pressure for 53 days at normal barometric pressure. T. = 15°–20° C.

Days since beginning of experiment.	Mice alive.	Deaths.	Killed for histological purposes.	Av. O_2 pressure in inspired air.		Average altitude corresponding to O_2 pressure.	Days at Mount Everest level.
				Atmosphere.	mm. Hg.		
				Per cent.		Feet.	
0	50	—	— }	11·6	81	16,000	0
7	50	—	— }				
14	50	—	—	9·8	68	20,000	0
21	50	—	—	9·3	65	22,000	1
28	40	10	—	8·2	57	26,750	3
35	40	—	9	8·3	58	26,500	3
42	29	2	—	8·0	56	27,500	3
49	22	7	2	8·7	61	25,000	1
53	20	2	18	7·2	50	30,000	3
Total ..		21	29	—	—	—	14

Average weight of survivors before experiment = 19·4 g.; after experiment = 15·9 g.; difference = −18·0 per cent.

Numerous other similar experiments were carried out on a monkey, 3 cats, 3 rabbits, 9 rats, and 2 guinea-pigs. Only the rabbits, mice, and rats were able to tolerate oxygen pressure as low as 7½ per cent. for any length of time; the monkey,[3] after a reasonable degree of acclimatisation, was collapsed, although it could be aroused with difficulty. Like the other animals which were unsuccessful, it showed evidence of heart failure, but recovered completely under normal oxygen pressure, regaining its lost weight and growing at the normal rate again.

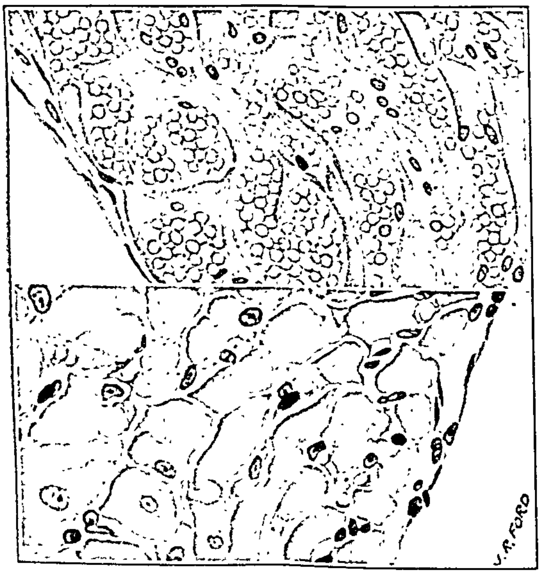
A few details of pathological changes in some of these animals have been described [2 3 4]; confirmation of these earlier results and fuller information from about 100 animals are now available.

Pathological Effects of Prolonged Exposures to Very Low Oxygen Pressure (7½ per cent.).

All the animals which died under very low oxygen pressure revealed extreme congestion of the liver, of parts of the lungs, and of parts of the heart. Marked congestion was also often seen in the spleen, the kidney, the brain, and the suprarenal; but the liver, lungs, and heart were often markedly affected when the other organs showed only moderate changes. Portions of the lungs were sometimes emphysematous. An extreme degree of fatty degeneration was observed in the hearts and livers of rabbits and guinea-pigs,[4] but only a slight degree—if any—in rats and mice. Nevertheless, in all four types of animal the congestion in parts of the heart and in the liver was so great that there was marked atrophy and even necrosis of the cells. *Occasionally œdema* was observed in several organs. The congestion was due to failure of normal forward movement of blood, the capillaries appearing engorged with blood and excessively dilated. Perhaps the dilatation in the first place was to help the heart, or it may have meant failure of vasomotor nervous centres. Such failure might be expected under very low oxygen pressure, but if the heart were able to work efficiently under low oxygen pressure there is no reason why the centres should suffer from oxygen deficiency, since the circulation could be accelerated as in exercise. In some animals the engorgement of the organs was so great that an increase in the blood volume was suspected; in others the congestion was not sufficiently widely distributed to suggest plethora as an embarrassment to the heart. Under low oxygen pressure the red cells increase in number and the viscosity of the blood is thus increased; to counteract this more fluid might be drawn into the circulation, the red cells then increase again, and so on until a plethora results from a vicious cycle. There is also the possibility of the marked dilatation of the capillaries being due in part to the production of histamine-like substances.

The heart muscle-fibres near the epicardium were widely separated from one another by the dilated capillaries and exhibited atrophic changes (see Fig. 1), whilst the liver cells appeared merely as the threads in a network (Fig. 2). The suprarenal sometimes showed atrophy of cortex and medulla, with disappearance of many cells from the latter. The kidney, although sometimes markedly congested, showed but moderate degrees of atrophy and degeneration. In the brain there was often congestion and occasionally disappearance of some of the nerve-cells. Ten of the animals which survived the experiment and were killed for histological purposes showed similar and equally marked changes, but a small majority showed a moderate degree of congestion, while two or three showed scarcely any change from normal; these two or three were apparently able to withstand the very low oxygen pressure. The simplest explanation is that their heart muscle was able to function under very low oxygen tension and to keep the circulation going well. In the animals which succumbed, the symptoms during life and the post-mortem evidence indicated the onset of heart failure as the main cause of inability to tolerate very low oxygen pressure. Undoubtedly all organs must be affected by the abnormally low oxygen pressure, but the supply and pressure of oxygen in the other tissues depend upon the ability of the heart to keep the circulation going strongly. If the heart could do this there was marked power to withstand low oxygen pressure as demonstrated by a few of the animals; if it could not the animals fell by the wayside at an earlier stage with the same pathological changes. These pathological results with animals offer a suitable explanation why climbing at high altitudes leads to fearful exhaustion.

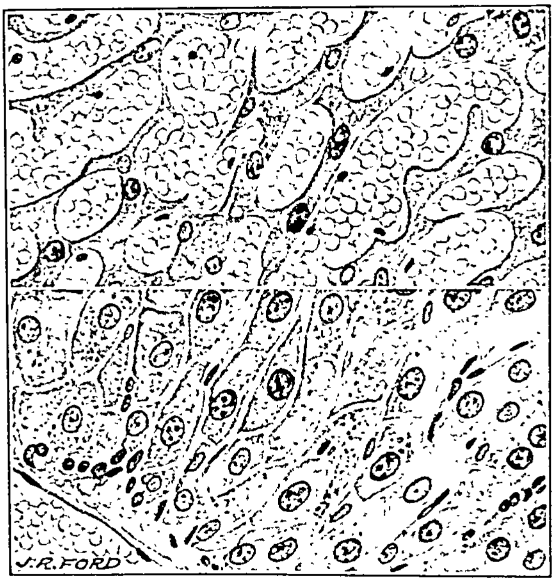
FIG. 1.



Monochrome drawings of heart muscle near the epicardium of a normal mouse (below), and of a mouse failing to tolerate low oxygen pressure. Note engorgement of capillaries, with effects upon muscle-fibres. Hæmatoxylin and eosin (× 450).

Judging from the number of deaths among these testing animals it seems doubtful whether human beings will be able to tolerate such a low oxygen pressure for a period long enough to reach the summit of Mount Everest, and it will be difficult to choose suitable climbers. It is suggested that subjects should be trained for some weeks by spending a few hours daily in decompression chambers and that they should then be tested for their ability to retain their mental and physical vigour in order to carry out the necessary muscular effort while breathing oxygen at about 7½ per cent. of an atmosphere. In this way those who were successful would have the advantage of knowing they could climb under low oxygen pressure such as they would experience on the summit of Mount Everest.

FIG. 2.



Monochrome drawings of liver from a normal mouse (below) and from a mouse failing to tolerate low oxygen pressure; note engorgement of capillaries with atrophy of cells. Hæmatoxylin and eosin (× 450).

Major Hingston [5] states that all the climbers had dilated hearts; their excessive panting on exertion was probably due to the onset of heart failure. They all showed loss of weight and of appetite at high altitudes. Similarly my animals in the present and previous experiments [3] lost on an average 20 per cent. of their weight, and they were young growing animals. Major Hingston states that the climbers with poor appetite preferred sweet foods at very high altitudes, and I found that the addition of glucose (5 per cent.) to the drinking water increased the consumption of fluid. I found that the animals consumed much less water when exposed to low oxygen pressure. Of course, mountaineers experience thirst at great altitudes because of the relatively dry air and the large volume breathed; but my experiments prove that low oxygen pressure itself tends to diminish water consumption. Some of the mice were given alcohol (2 per cent.) in the glucose solution and others adrenalin chloride (1/100,000, Parke, Davis and Co.) freshly dissolved in glucose solution every few days; but none of these substances materially benefited the animals, judging by the average weights of different batches of ten mice.

Acclimatisation to Very Low Oxygen Pressures.

It is not always very clear what is meant by the word acclimatisation. According to Major Hingston,[5] Somervell believed that acclimatisation took place at 21,000 feet even though there was physical deterioration and dilatation of the heart; evidently in this case acclimatisation means absence of the subjective symptoms of mountain sickness. Perhaps acclimatisation is usually taken to mean maintenance of normal appetite leading to normal metabolism and bodyweight.

Dr. J. S. Haldane [6] recently gave it as his opinion that secretion of oxygen by the lung was necessary to explain the great efforts displayed by the 1924 expedition. He holds that in this way the oxygen tension in the tissues is kept near normal in acclimatisation. Prof. Joseph Barcroft [7] supports this view of tissue oxygen tension, but opposes the secretory theory and puts forward various other factors for acclimatisation. My own recent experiments [2,3,4] on tissue oxygen tension, where the oxygen tension in the tissues was actually measured for the first time, gave no support to the opinion that oxygen tension in the tissues is kept near normal; all my animals, including those which acclimatised well, showed a markedly subnormal tissue oxygen tension under very low oxygen pressures in the air. In my opinion acclimatisation means the ability of the tissues, particularly the heart, to tolerate a low oxygen tension and to function normally. Acclimatisation takes place far too rapidly in some cases to be explained by such slow changes as increase of hæmoglobin and of red cells, or alteration of oxygen dissociation curve. It is not argued that increased breathing, increase of hæmoglobin, &c., are not of value when they do occur; no doubt they are, but they are not capable of bringing the oxygen tension in the tissues to normal again whilst under very low oxygen pressures in the air. The main factor deciding the power to tolerate very low oxygen pressure is the heart muscle.

It is well known that short spells of very low oxygen pressure are tolerated by certain individuals—e.g., air pilots and other experimental subjects. Major Hingston records that birds flew up around the camp at high altitudes but did not remain there long. It is the prolonged periods of exposure which slowly work their harmful and more than temporary effects. The longer the climbers are exposed to very low oxygen pressures the smaller will be their chance of reaching the summit, however expert climbers they may be. Perhaps the daily inhalation of oxygen at normal pressure for a few hours—as suggested by Dr. Leonard Hill—when above 15,000 feet might inhibit, to some extent, these evil effects. The failure of oxygen in the previous expeditions was perhaps due to the fact that damage to the heart had already occurred and a short spell of breathing purer oxygen could not be of any great use. What the climbers required was complete rest under higher oxygen pressure for a longer period, and not further climbing efforts at a higher altitude hampered by an oxygen apparatus.

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CARLISLE INFIRMARY AND THE FEVER HOSPITAL.—The result of an inquiry by Mr. W. F. Fox, of the Charity Commission, into the question of transferring control of the Fever Hospital to the Carlisle City Corporation has now been announced. It may be recalled (see THE LANCET, June 16th, p. 1239) that the governing body of the Cumberland Infirmary, which is in urgent need of extension, was opposing the transference, as the infirmary would then lose its only feasible means of extension. The Charity Commission reports that the inquiry "failed to disclose any practical alternative to the scheme proposed in respect of the Fever Hospital, or to show that the scheme will place the Infirmary in any worse position than at the present." The Commissioners will therefore proceed to complete and establish the scheme, to the great regret of the infirmary governors.

BRITISH EMPIRE CANCER CAMPAIGN.

ANNUAL REPORT.

THE report of the year's work was presented by the Grand Council of the British Empire Cancer Campaign at the annual meeting held at the House of Lords on July 9th. A steady development of activities is recorded. The number of research workers subsidised had been substantially increased, larger grants have been made to institutions, and new centres have been started, notably in Manchester, Liverpool, and Chester.

The Council in an introductory review of the work in progress comment on the difficulty, familiar to all bodies who propose to subsidise research on a large scale, of finding a sufficient number of suitable workers. They express the hope that the International Conference on Cancer, which will meet under their auspices on July 17th in London, will assist in coördinating existing knowledge of cancer problems by enabling English and foreign workers to exchange views on a common footing. Summaries under appropriate headings of the results of research carried out during the year under the auspices of the campaign appear over the signature of Mr. J. P. Lockhart-Mummery, the honorary editor of the report. These general summaries serve to show how wide is the scope of the investigations being made, but they would be more useful if documented by references to the names of workers or of institutions, or to the pages in the report where results are recorded.

During the year efforts have been directed towards the production of immunity against cancer, and to the perfection of the technique of making records of the behaviour of malignant cells in tissue culture. Chemotherapy and radiotherapy have been tried experimentally and on the human subject. The virus theory put forward by Gye has been critically examined, and the study of carcinogenic substances has been pursued. We select for notice the attempts to produce immunity, the studies of therapeutic agents other than surgery, and work on the virus theory.

Attempts to Produce Immunity.

In the Cancer Research Department of the Middlesex Hospital Dr. S. L. Baker and others have inoculated fowls with emulsions or filtrates of the Rous sarcoma, which have been rendered inactive by heat, formalin, or ultra-violet radiation. No definite or lasting immunity has been thus obtained. Prof. S. Russ and his colleagues, working in the same hospital, found that normal rats can be effectively protected against tumour growth by means of tumour tissue which has been exposed to a suitable dose of radiation; the same tissue which can cause a high degree of protection when fresh can cause some stimulation of tumour growth when autolysed. The production of immunity in this way is a process very sensitive to local conditions and very easily disturbed. Four different types of tumour have been used to produce resistance in rats, two carcinomas and two sarcomas. Rats resistant to one type of sarcoma proved resistant to the other type, and mostly also to a hæmorrhagic quickly-growing carcinoma, but no cross immunity was established between the other carcinoma and the sarcomas. Dr. J. C. Mottram, of the Radium Institute, found that chickens in which skin tumours had been made to disappear by radiation were sometimes immune to subsequent inoculation. At the Lister Institute Dr. T. Lumsden has attempted to produce a tumour vaccine by injecting into a tumour a dilution of formalin just adequate to kill the cells while producing little alteration in their chemical constituents. He states that in the last series of 40 rats thus treated 38 were cured of implanted tumours, and of these 36 were afterwards found to be immune. He suggests that concentrated antiserum may be even more effective than formalin, but it is more difficult to obtain. This form of treatment has not yet been tried on spontaneous tumours except in one case.

A rat with a spontaneous mammary tumour was treated with three inoculations of 2 c.cm. concentrated antiserum from a human subject with breast cancer; the tumour disappeared for four months, but then recurred. Dr. Lumsden hopes to be able to make further trial of this treatment on spontaneously occurring tumours. At the University of Edinburgh Mr. J. J. M. Shaw has attempted to determine whether autogenous epithelial implants will protect mice from the production of tumours by applications of tar. The experiments suggest a slight measure of protection, but are not conclusive. Mr. F. C. Pybus and Mr. H. R. Whitehead, working at Newcastle, failed to demonstrate a serum specific against malignant cells growing in vitro. Mr. Harold Burrows is examining the mode of action of various cytolytic agents in connexion with immunisation.

Tissue Culture.

Besides those who have used the method of tissue culture in their researches on the production of immunity many others are now employing this technique. At the Middlesex Hospital factors influencing the rate of growth of embryo, adult, and malignant tissues are under test, and permanent records are being made by the cinematographic process. At St. Bartholomew's Hospital Dr. Malcolm Donaldson and Dr. R. G. Canti have been studying the action of irradiation respectively on normal and malignant cells in tissue cultures with the cinematographic apparatus designed by the latter. They hope by this means to elucidate the laws governing the disappearance of malignant growth under the action of radium. Mr. E. Neville Wilmer at Manchester has, with Mr. L. P. Kendal, investigated the properties of the growth-activating principles in Witte's peptone. Contrary to the results obtained by Carrel they found that the pure proteose fraction was inactive in saline media.

Therapeutic Methods.

At the Cancer Hospital (Fulham-road) the blood-picture during the clinical application of X rays has been studied. The conclusion is reached that dosage should be controlled by blood-counts, since over-dosage is dangerous. Patients vary in their resistance to radiation, and repeated doses at short intervals appear to exercise little influence on the blood until the "saturation point" is reached, when a sharp diminution of the white cells occurs. The change in the blood is likely to progress when once initiated until a minimum value is arrived at, after which, if no further treatment is given, the blood-picture returns to normal; but if the initial dose has been too large the patient may not recover. The effect of a dose administered at the crucial stage when saturation point has been reached is not easy to calculate, and this is a defect in a mode of treatment which nevertheless is said to be used successfully in an increasing number of patients. The combination of radiations of various wave-lengths is said to be giving encouraging results in the treatment of superficial cancers.

Lead treatment of cancer has been tried at various institutions. Workers at the Middlesex Hospital, after strictly controlled animal experiments, arrived at the conclusion that even when this treatment was begun within five days of the inoculation of a tumour no appreciable effect could be observed on its progress. The result of blood analyses on human patients treated by this method showed a consistent rise in the non-protein-nitrogenous content: in cases examined after death the blood-urea had risen to abnormally high levels. From St. Bartholomew's Hospital the report on this treatment is even more unfavourable. No evidence was obtained that the use of lead by intravenous injection leads to the resorption of neoplastic tissues in man: the average duration of life after treatment was less than the expectation of life without such treatment; and the histological appearances of the growth before and after treatment were indistinguishable. A series of cases treated by lead followed by deep X ray therapy gave more encouraging results, but it is not clear to which of the agents the improvement, when it occurred, was due. In Birmingham a team consisting of Dr. A. P. Thomson and Dr. G. Bulmer, Dr. F. W. Mason Lamb and Mr. G. Sanders, M.Sc., have treated 34 patients with colloidal lead. It is not stated whether these were inoperable when first seen. Two cases were markedly improved, three slightly improved, and five remained stationary; three deaths might be attributed to the treatment. The conclusion reached was that the method is of distinct therapeutic value, and a suggestion is made that the most profitable results will be obtained in cases where palliative incomplete operations have been performed. Dr. F. D. M. Hocking, working at Westminster Hospital, reports favourable changes in cases of carcinoma (not in sarcoma) following injections of thorium and uranium.

Radium.—Among the accounts of treatment is a report from the Westminster Hospital stating that "the treatment of oral cancer by radium has practically displaced surgical treatment." The Cancer Research Committee of the London Association of the Medical Women's Federation have had good results with radium in uterine cancer, especially in cancer of the cervix. St. Bartholomew's Hospital Radiological Cancer Research Department consider that it is too early to draw conclusions from the condition of the cases treated, but they pronounce that in breast cases the results of radium have been "very promising indeed." and that the results in cancer of the upper air passages and uterus show a marked improvement on those reported in previous years. A hopeful sign is that no patient reported "free from signs of disease" in previous reports has yet developed a recurrence. In Birmingham, of 26 cases of inoperable cancer of the rectum treated by radium five are definitely improved, two being completely well at present; the time that has elapsed since the treatment was given is not here recorded.

The Virus Theory.

At the Cancer Hospital Research Institute, under the direction of Prof. A. Leitch, the Rous tumour has been transmitted to fresh fowls by the inoculation into the pectoral muscle of the minced pancreas, free from metastases, from a tumour-bearing bird. Control inoculations with a composite mince of liver, spleen, kidneys, and muscle from infected birds did not yield positive results. In other experiments, following Gye's technique, an extract from the Rous sarcoma was treated with chloroform sufficient to destroy the "virus"; a quantity of this extract was then injected into the pectoral muscles of one side of a fowl and about half of the quantity injected into a corresponding region of the other side, together with a portion of minced pancreatic extract from a normal fowl. Tumours were produced only from the side where pancreas was injected. Since, according to Gye's theory, the chloroformed extract contained only the accessory chemical factor, the cancer virus would have had to be supplied by the normal pancreas. This experiment, therefore, provided evidence against Gye's theory and led to the further study of the active principle. Some support was obtained for the view that the active agent of the Rous sarcoma may be enzymatic in nature. The difficulties of interpretation are increased by the fact that no means exist for separating viruses from enzymes. Workers from the Middlesex Hospital consider that the evidence that the Rous sarcoma is due to a filtrable virus seems good. No definite evidence has been obtained that mammalian tumours contain a virus, though Gye's experiment in which chloroformed Rous tumour filtrate is activated by a "culture" of a mammalian tumour has been repeated. The activating effect of fluid containing pieces of mammalian tumour may be due either to the addition of a ferment, or of some non-specific substances, to an attenuated Rous virus, rather than to the addition of a fresh virus of mammalian origin. In Edinburgh Mr.

C. F. W. Illingworth is carrying out a critical repetition of certain of Dr. Gye's researches.

Financial Position.

Owing to the gift of £10,000 from an anonymous donor the income of the campaign this year has exceeded the expenditure. Attention is drawn to heavy commitments for the future, notably the publication of the *Cancer Review*, which is now a permanent feature of the campaign's work, and has to be provided for over a period of five years at a total estimated cost of £15,000. The cost of the journal for the present year amounted to £2538, administrative expenses to £2676, cost of appeals to £2673; grants to hospital and research workers accounted for £18,158.

The public are reminded in the report that no claim to have discovered anything important bearing on the cure or prevention of cancer is left uninvestigated, and that no proper appeal for assistance is refused without careful consideration.

MATERNITY AND INFANT WELFARE.

NATIONAL CONFERENCE AT GUILDHALL, LONDON JULY 4TH–6TH.

A CONFERENCE promoted by the National Association for the Prevention of Infant Mortality, in coöperation with the M. and C.W. Group of the Society of M.O.H.'s, was held from July 4th to 6th in the Guildhall, London, under the auspices of the Central Council for Infant and Child Welfare. There was a large attendance of delegates including representatives from the Dominions and other countries. The first day of the meeting was devoted to visits to child welfare institutions. The actual conference was carried through in four sessions on the second and third days.

Relative Values.

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Dr. F. T. H. Wood (M.O.H., Bootle) thought it would be difficult to work an antenatal clinic conducted by general practitioners in towns, and Dr. Whitehouse in reply urged the extreme importance of interesting the general practitioner in antenatal work and suggested that Dr. Wood's objection might be met by the holding of more frequent clinics.

Dr. Helen MacMurchy (Canada) said that 641 replies made by the 8000 practitioners of Canada to a Ministry questionaire indicated that many practitioners had solved this question for themselves. One practitioner had had no maternal death in 37 years and many had had no deaths among a series of 1000 cases.

Mr. K. M. Grant (Salford) urged that doctors should work only with trained midwives at confinement cases.

Prof. Louise McIlroy (London) spoke on the great importance of postnatal clinics to ensure that everything possible was done to repair damage left by the confinement. She described a "Discharge card" issued by the Royal Free Hospital to every woman who left the lying-in wards. The card gives particulars of the character of the labour, the condition of the mother and infant on leaving, &c., and is intended to be taken by the patient to any clinic (or doctor) which she may attend subsequently. Most so-called diseases of women were due to confinements. Lacerations were inevitable, but their repair was most important. She believed that cancer of the cervix, which took a larger toll of women's lives than childbirth, could be to some extent prevented by careful postnatal supervision. The antenatal doctor leaves the confinement to the midwife, but the midwife should send the patient back to the doctor for overhaul after the confinement. If each mother was supplied with a card or obstetrical "dossier" recording all her pregnancies and confinements it would save an enormous amount of speculation on the part of medical attendants.

Prof. Pirquet (Vienna), who was invited to speak, referred to the work done by the League of Nations Committee in the investigation of the causes which led to the very different mortality-rates in the various countries. He said that Norway led Europe with an infant mortality of about 30 and that Oslo led also in birth control, but that they had gone too far in this latter respect, the birth-rate being less than a quarter of what it used to be. He could sympathise with birth control after the sixth or seventh child, but not as regards the first. He regarded the tendency to avoid having children as a mere fashion, which would pass away. The birth-rate in France was now going up a little. The resident population of the U.S.A. had few children, but there was some evidence of a change of viewpoint, and the desire for the first child was being put before the desire for a car. One of the important points in which the public needed education was the protection of the lying-in mother and her baby from catarrhal infections brought in by neighbours.

Dr. Esther Rickards said they had the advantage in Tottenham of a unification of the public medical services. The midwives were being induced to send back the mothers to the clinic for postnatal overhaul. One-third of the women examined at the antenatal clinic came back to her about four weeks after confinement and 50 per cent. needed some treatment. Health visitors can also persuade the mothers to come to the clinic. Coöperation with the midwife was most important. Infant cards, school cards, antenatal cards, and confinement dossiers should be passed on, completing the cycle.

Maternal Mortality.

Dr. Eardley Holland (London) opened the discussion on the causes and prevention of maternal mortality at the third session, presided over by Dr. Elwin H. T. Nash. The safening of child-bearing should, he said, be the outstanding problem of public health. In spite of the able reports on the subject issued first by the Local Government Board and more recently by the Ministry, they had not yet captured public opinion. Other countries beat us—for example, Holland, Denmark, Sweden, Norway, and Italy—all with rates under 3 per 1000. Some countries were worse than we were—Switzerland, Germany, and the U.S.A. Sepsis accounted for about 40 per cent. of the deaths and 70 per cent. of the septic cases were complicated labours. He had recently had the opportunity of investigating conditions in Sweden. The Swedish maternal mortality had remained at about 2·5 per 1000 births during the last 25 years, in spite of efforts to reduce it still further. Contracted pelvis was rare in Sweden and toxæmias were less frequent than here. In Sweden the medical curriculum lasted nine years and the medical students had four months' residential training in midwifery in large hospitals manned by experts, in which there were no midwives trained, the medical students doing all the midwifery work. The midwives went through two years' training also in large maternity hospitals in which there were no medical students. The antenatal work in Sweden was done by obstetrical experts. All Swedish mothers were attended by midwives and the doctor was only summoned for complications or to give anæsthetics. The maternity hospitals were splendid and 30 per cent. of the women were confined in them last year. The number of practising midwives was becoming less as more mothers went into hospitals for confinement. Midwives in Sweden have been trained since 1680, their training is founded on a very good education, and the service has great traditions. Both the midwifery and medical professions enjoy much greater prestige in Sweden than in this country. This confidence in the midwives and doctors abolishes the fear towards child-bearing which is so prevalent here and which is inculcated in our prayer-book and certainly affects the proper performance of the function of child-bearing. He thought, if we gradually reorganised our obstetric service on the lines adopted in Sweden, we might ultimately halve our maternal mortality and save 1500 lives of mothers annually in addition to preserving the health of very many more. Up to now our efforts had been utterly futile.

Dr. R. Veitch Clark (M.O.H., Manchester) said that maternal mortality involved maternal morbidity and neonatal mortality, besides being a lamentable destroyer of home and family life. Fifty per cent. of gynæcology was concerned in repairing the damage done by child-bearing. In spite of the fact that Manchester lost half the sunlight available in the neighbourhood, nowadays they only saw rickety deformities in adults, and we could look forward hopefully to the disappearance of pelvic deformity as a cause of death in child-bearing in another generation. The remedies for high maternal mortality—viz., antenatal supervision and a better midwifery service—were rendered difficult to obtain by the fact that the expectant mother does not know she needs them. Nurses, health visitors, and midwives are those who can best educate the mothers. The midwife should be guaranteed her fee if she loses her patient by sending her to the antenatal clinic, and the remuneration of midwives should be raised, if necessary, by subsidies. Investigation in Manchester had shown that privacy for the confinement was impossible in the majority of homes and maternity hospital beds were therefore needed for normal cases. The antenatal centres should be grouped round the larger hospitals. Much further research is required as to the physiology of pregnancy.

Mr. Aleck Bourne (London) was convinced, as a teacher and examiner of midwives, that insufficient stress was laid on the general principles lying behind the practical details. Quite ineffectual solutions of lysol might take the place of cleanly methods. Rubber gloves, judging by the careless way they were used, were regarded as possessing magical properties. The talk about antenatal work was throwing into the background the importance of recognising abnormalities early in labour. One examination of the urine

C. F. W. Illingworth is carrying out a critical repetition of certain of Dr. Gye's researches.

Financial Position.

Owing to the gift of £10,000 from an anonymous donor the income of the campaign this year has exceeded the expenditure. Attention is drawn to heavy commitments for the future, notably the publication of the *Cancer Review*, which is now a permanent feature of the campaign's work, and has to be provided for over a period of five years at a total estimated cost of £15,000. The cost of the journal for the present year amounted to £2538, administrative expenses to £2676, cost of appeals to £2673; grants to hospital and research workers accounted for £18,158.

The public are reminded in the report that no claim to have discovered anything important bearing on the cure or prevention of cancer is left uninvestigated, and that no proper appeal for assistance is refused without careful consideration.

MATERNITY AND INFANT WELFARE.

NATIONAL CONFERENCE AT GUILDHALL, LONDON JULY 4TH–6TH.

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UNITED STATES OF AMERICA.

(BY AN OCCASIONAL CORRESPONDENT.)

The Minneapolis Meeting: Presidential Address.

THE seventy-ninth annual session of the American Medical Association, held last month at Minneapolis, Minnesota, was made notable by the presidential address by Dr. W. S. Thayer, of Baltimore, an address showing great breadth of vision and couched in beautiful language. Dr. Thayer reminded his audience that they represented a profession organised for no selfish end, but, as their constitution has it, " . . . to promote the science and art of medicine and the betterment of public health." Since it is the unusual which constitutes news, the self-seeking commercialised doctor is the one who is shown most often in the newspapers. Too many of us generalise carelessly from what we read in the papers. " I am not likely to forget," he said, " the response given by a large assembly of physicians in London when the Lord Chief Justice, in a graceful address, spoke of the fundamental likeness between the profession of law and that of medicine, each humane and devoted to the alleviation of the ills of mankind. The audience laughed. I was mortified and pained." Nevertheless, continued Dr. Thayer, to be a physician to-day is a privilege. Few greater opportunities are given for immediate service to our fellows, and for that intimate association with men and women which cultivates human charity and sympathy and understanding and tolerance, one of the most beautiful of words, and temperance, one of the most abused. To make the most of his opportunities a doctor must have a basic education—one that should enable him to appreciate that which is fine in life, in art, and in literature.

Standard of Medical Education.

Through the efforts of the American Medical Association, with its council on education, and the generous assistance of the foundations, the standards of education in the profession have been materially raised until to-day the opportunities for medical education in America, fundamental and post-graduate, are second to none.

> " Recently," Dr. Thayer remarked, " we have met with rather severe criticism in the delightful, although somewhat acrid, address of Sir Andrew Macphail,[1] who bitterly complains that the raising of our standards of admission to schools of medicine is flooding some of the institutions of a sister country with undesirable men. To which one can only reply that we are truly very sorry. We should be only too happy to deliver him from the plague of locusts from which we have been delivered ourselves. We did not mean to turn the cloud in his direction. But would he ask us to take them back? "

The Full-time Plan.

There has been considerable criticism of the so-called full-time plan in this country which did not fail to find some expression at this session of the House of Delegates. Dr. Thayer, however, deprived the critics of most of their thunder by pointing to three main misconceptions on which criticism has been based. It has been said that in some schools a professor is debarred from private consultation. Dr. Thayer knows of no school of which this is true. The understanding that exists in some schools that fees for private consultation shall be turned into the budget of the professor's department has been denounced as the practice of medicine by an institution. This aspect of the plan, Dr. Thayer points out, is in any case a detail, and in no sense a vital principle. Third, and most important, is the misconception that it is the ultimate ideal of the university school of medicine to place clinical teaching in the sole hands of university professors.

Early Specialisation.

Turning to the content of the four years' course in medicine, Dr. Thayer suggested that the attempt has been made to crowd too much subject matter into these years. The medical school is not the place for the training of specialists, nor can one emerge from a school of medicine a skilled surgeon. The specialist who has not had a good basic medical training is a danger to society. Too early specialisation is one of the great faults of modern American education. The speaker suggested that those responsible for the curriculum of the nurses' fundamental course are perhaps making the same kind of mistake. The tendency of modern practice is more and more towards specialisation and organisation, and away from the obviously desirable intimate contact between physician and patient. This is in line with the trend of society in other fields, but it raises problems of great importance to the profession. In seeking solutions there are certain fundamental truths to be remembered: " We have," said Dr. Thayer, " duties as physicians towards our patients, to treat them when ill, to advise them lest they become ill, and to the public lest the sickness of our patients becomes a menace to the public health. We have duties also as members of the public who are specially informed and so specially responsible to see that our public health officials are men of high character and adequate training."

The attendance at this session of the meeting was almost 5000, and the scientific exhibit easily the largest and most successful on record. The presidential address and most of the scientific papers read at the session will be fully reported in the journal of the Association.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Housing Conditions in Edinburgh.

THE chief sanitary inspector for Edinburgh, in his annual report for the year 1927, remarks on the progressive policy of the local authority in connexion with slum clearance and housing improvement. Much still remains to be done in improving the housing conditions in many parts of the city. A recent survey showed that there were no less than 5035 houses that could be classified as unfit for habitation. These are mainly situated in the central and more congested parts of the city, but there are also large groups in the more suburban areas. Of the total number, 2243 are one-apartment houses, 2327 contain two apartments, 370 three apartments, and the remainder four or more apartments. Many of these houses have been listed for inclusion in future improvement schemes. If the progress made during the past few years is maintained the whole of these houses could be swept away in a comparatively short period. It has been found that to obtain the best results constant supervision of the occupiers of the new houses is essential. Accordingly, in addition to the routine inspection, arrangements are being made for the systematic visitation of the houses by an experienced inspectress who is to devote special attention to backward tenants. These visits have already achieved good results in improving the habits of the people.

In connexion with this report, it is interesting to note that the Board of Management of the Edinburgh Welfare Housing Scheme have recently issued a special appeal for financial assistance in connexion with the housing scheme which they intend to inaugurate in Edinburgh. They aim at a sum of £25,000 to £30,000, to be raised partly by voluntary gifts and partly on debenture loan. If such a sum were raised, or even, to start with, a smaller amount of £7000–£8000, an experimental block of suitable houses could be provided, which would be let at about 8s. 6d. a week, inclusive of rates. The houses, at the seventh month was of little or no use. The urine should be tested every fortnight during the last two months of pregnancy, however fit and healthy the patient appeared to be. The occurrence of hæmorrhage, however slight, during pregnancy, was not always regarded seriously enough. The midwife should be paid better and her status advanced.

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[1] Macphail, Andrew: American Methods in Medical Education, Brit. Med. Jour., 1927, ii., 373.

At the fourth session Dr. JANE TURNBULL (Ministry of Health) described possible administrative arrangements for the unmarried mother and her child.

MEDICINE AND THE LAW.

Medical Confidence (Attempted Suicide).

AT an inquest at Eastbourne, held at the end of last month, upon the body of a man who met his death on Beachy Head, Dr. R. R. Pirrie stated that two years ago he was called in to see the deceased, who had been found unconscious in a gas-filled bathroom. Asked by the coroner if it was not usual in such cases to report the occurrence to the police, Dr. Pirrie replied in the negative. "From the legal point of view," pursued the coroner, "you may be guilty of being an accessory in not notifying a case of attempted suicide?" "Yes," replied the witness, "but I look at it only from the medical point of view; I am prepared to risk being charged as an accessory; in this case the man recovered and I warned the family." In bringing in a verdict of "suicide while of unsound mind," the jury added as a rider that they thought it would have been as well if the doctor had reported the previous incident. Unperturbed by this declaration, which he described as "purely a pious resolution and not part of the verdict," Dr. Pirrie rejoined that a practitioner has a duty to his patients and that it is not his duty to report such a case to the police.

There can be no doubt that the medical profession will approve their colleague's action and statement of principle in this matter. The patient required treatment, not prosecution. The jury, perhaps, held the mistaken view that medical privilege is claimed and maintained in order to save doctors the trouble of taking part in police proceedings. Medical privilege exists in the interests of the patient. The patients, or their families, require the best medical advice and treatment at the moment, and frank disclosure of all the facts may be necessary in order that the medical assistance may be invoked to the best advantage. There will necessarily be some hesitation on the part of the family in these cases if it is possible (or indeed probable) that the doctor may regard it as his duty to set the police in motion and to furnish them with information not intended to be so applied. There may be occasions when a doctor may have the duty of disclosing his knowledge of a crime, or at any rate of putting such moral pressure upon the criminal as he may deem proper with a view to prevention or confession. One case differs from another and a general statement of professional propriety is difficult; but the duty to the patient comes first. In the Eastbourne case Dr. Pirrie's warning to the relatives was of more practical value than a notice to the police. Action by the police might well have aggravated the patient's condition.

Consideration for Medical Witnesses.

By the courtesy of the courts it has been customary to give special consideration to medical practitioners when called as witnesses. It has been realised that the nature of their duties makes it desirable not to keep them in attendance in courts of law longer than necessary, and it has been found possible sometimes to interpose their evidence out of its turn and usually to release them at the earliest moment. It need not be assumed that this convenient course is to be interrupted merely because of some observations of Mr. Justice Horridge at Hereford Assizes last month. Asked by counsel if a country doctor, who had given his evidence, might be allowed to leave the court, the judge is reported to have replied that doctors were very useful people, but they seemed to think that the administration of justice was entirely subservient to their convenience. "There may be one or two questions I want to ask: he must wait." The court, we are told, then adjourned for lunch. No witness, whether medical or otherwise, would regard it as unreasonable that he should remain in attendance until the court had heard the whole of his evidence. Medical witnesses, however, are justified in asking leave to return to their professional duties as soon as their evidence has been fully given unless, of course, the case is one in which they have undertaken to be present throughout and to advise upon the evidence given by others. A proper application to the judge, deferentially submitted, will usually receive a courteous answer. The remarks of Mr. Justice Horridge may either be dismissed as not very seriously meant, or else discounted as mere obiter dicta.

Criticisms of Coroners Acts.

Fresh criticism has recently been directed at the amendment in the law of coroners made in 1926, whereby inquests can be dispensed with. Such cases fall into two classes. First, there are the deaths where the coroner, after his own private inquiries and without any post-mortem examination, has satisfied himself that no inquest is necessary; he then informs the doctor in attendance on the deceased that he sees no objection to the cause of death being certified as suggested. Secondly, there are the "no inquest" cases, within Section 21 of the 1926 Act, where the coroner (1) believes that a post-mortem examination may prove an inquest to be unnecessary, (2) asks a doctor to make a post-mortem examination and report under the new statutory power, and (3) being thereby satisfied that an inquest is unnecessary, sends the registrar "a certificate under his hand stating the cause of death as disclosed by the report." The report in the latter case is not, of course, given upon oath, and those who are critical of the Scottish system of inquiry (shorn of the publicity which the inquest ensures in England) have not hesitated to comment on the change. Dr. F. J. Waldo, in his evidence before the Home Office Committee on Coroners, once laid down the principle that, if a post-mortem examination be necessary, a public inquest with the witnesses on oath, and in the presence of the relatives, was equally necessary. Parliament, however, in 1926 gave the coroners a discretion in the matter, carefully guarded (subs. (3) of Section 21) by the saving clause that the new provision should not be construed as authorising a coroner to dispense with an inquest in any case where there was reasonable cause to suspect that the deceased had died either a violent or unnatural death, or had died in prison or in certain other special circumstances. If the country has thus —through Parliament—shown this sign of confidence in coroners and the medical profession, those who are so trusted need not repudiate their responsibility. If that confidence is found to have been too lightly given, public opinion would doubtless insist on a change in the law. Meanwhile, there is all the greater obligation upon members of the medical profession to be scrupulously careful and exact in matters of death certification. Solicitors, of whom a high standard is expected in proceedings where large sums of money may be at stake, are fortified in the discharge of their duties by the knowledge that they are, by statute, "officers of the Supreme Court." The medical profession has an even greater responsibility.

THE DUCHESS OF YORK AT HOSPITALS.—On Tuesday in last week the Duchess of York opened a new fresh-air ward and an operating theatre at the St. Nicholas Hospital for Crippled Children at Pyrford, Surrey. Also last week the Duke and Duchess opened an extension of the Queen Alexandra Memorial Hospital at Weston-super-Mare which, with its equipment, has cost £50,000.

SCHOOL MEDICAL SERVICE.

Name of district.	No. on roll.	Average elementary school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.†
Bedfordshire	—*	—*	4,262	1,572	18·65
Cumberland	—*	—*	7,862	12,593	20·0
Torquay	3,751	3,259	1,339	5,546	21·0

* Not given. † Excluding dental defects and uncleanliness.

Bedfordshire.

THE value of medical inspection is greatly lessened if no treatment clinics exist where parents can obtain advice and minor ailments receive medical attention. Home visits by the nurses are a valuable adjunct to such clinics but can never satisfactorily replace them. It is therefore disappointing to note under Table IV., "Return of defects treated during the year," that no minor ailment has been treated in Bedfordshire under the council's scheme; this presumably means that no minor ailment clinics exist in this county. The school medical staff consists of Dr. R. T. Herdman, S.M.O., and deputy M.O.H., one school dentist, Mr. F. S. Cooper, and one school nurse.

Dr. Herdman remarks that the health of the children seems to be less good this year than it was last year; he attributes the deterioration partly to an epidemic of influenza in the beginning of 1927 and to the sunless summer and autumn. It is clear, however, that his department is understaffed and that the county lacks the facilities on which some of its neighbours rely for the promotion and maintenance of good health in school-children. Dr. Herdman, working single-handed, cannot do impossibilities, and his dental colleague, Mr. Cooper, obviously finds it increasingly difficult to keep pace with his work. It is curious to find treatment facilities so inadequate. There are apparently no special schools of any kind, and no mention is made of open-air schools or orthopædic schemes. This is surprising and inconsistent, for in other directions great efforts seem to be made on modern lines. For example, the senior scholars who are transported from smaller villages to larger centres there receive a good hot mid-day meal, which is cooked, served, and cleared away by the children; moreover, efforts are made to supply dry stockings and slippers for children who have walked long distances to school.

Cumberland.

Dr. F. H. Morison, M.O.H. and S.M.O., explains that the county is divided into six areas, each in the charge of a medical officer responsible for the whole of the work in the area. He stresses the importance of coördination; in Cumberland record cards of the welfare centres are passed on to the schools and show that the percentage of defects in the entrants would be considerably reduced if it were possible to examine and treat all the infants before they came to school. The proportion of entrants requiring treatment this year is three times as high as last year. These children were for the most part born in 1922, which year had a relatively high infantile mortality-rate in the county and a correspondingly high sickness-rate in the next four years of life.

Dr. Morison discusses in a broad-minded way the problem of tonsils and adenoids, citing a case where the prosecution of the parents by the N.S.P.C.C. for refusing treatment aroused hostile comment. He states that he has always laid down the principle that the mere presence of enlarged tonsils and adenoids is not necessarily an indication for operation, but that in certain cases, particularly those with ear symptoms, it is essential to secure their removal. In the particular instance where action was taken, it was the opinion of three members of the school medical staff and of the family doctor that the operation was urgently needed. Hospital accommodation being inadequate, some cases of surgical tuberculosis have been nursed in frames in their own homes, the children being visited once a week by the orthopædic after-care sister and once in four months by one or other of the visiting staff from Windermere. Advantages claimed for this system are (1) considerable saving in expense (a case of spinal caries in hospital may cost as much as £250); (2) the children can start treatment at once without waiting for a hospital vacancy; and (3) hospital beds are left free for the admission of non-tuberculous cripples, who can be dealt with in a much shorter time. It is admitted that the procedure is often impracticable—in rural areas where close supervision is impossible, where parents are not able to coöperate properly or to provide extra food, and where home conditions do not allow open-air treatment. To us it seems that the system may be of some value as a temporary device but not as a satisfactory substitute for more hospital accommodation, which seems to be urgently needed.

Further reports are given on the benefits of iodine in goitre. Dr. Kenneth Fraser has been elected a Fellow of the Royal Society of Edinburgh for his valuable work in this connexion. This year for the first time calcium is also being administered in the hope of improving the results of treatment.

Torquay.

The M.O.H., Dr. T. Dunlop, introduces the report by Dr. J. V. A. Simpson, assistant S.M.O.

The arrangements for the coördination of the work of the school medical service with that of the health department are satisfactory; and the same medical officer who carries out the routine school work attends the maternity and child welfare centres and thus supervises the health of the children from birth right up to school-leaving age. All the facilities for treatment are available for the pre-school child, including the dental service. The good results of Mr. T. G. Fenton's operations for removal of tonsils and adenoids at the Torbay Hospital are recorded. All cases are seen after operation by the medical officer and instructions are given as to the after-care of the child. Dr. Simpson, who is responsible for this report, would prefer an arrangement whereby hospital after-care could be provided for at least 24 hours; and possibly this may be secured when the new hospital is erected. Cripple children for some years past have been sent to special hospitals in London, Bristol, Alton, and elsewhere. No child failed to receive treatment except when parents refused it (two cases). During the past year a comprehensive orthopædic scheme for the county of Devon has been inaugurated and the Torquay authority is coöperating in this. The school clinic is used as the local orthopædic centre once a week and Mr. Brennan Dyball visits it once a month. The year at the open-air school has been highly successful; during the summer a complete set of baths, including shower baths, was installed. The climate of Torquay is so mild that the children can be out in the open air on more occasions than in most other towns in the kingdom; rheumatic children are apparently receiving much benefit from this school.

Dr. Simpson is using the kata-thermometer for estimating the adequacy of ventilation in existing schools and in those being reconstructed. He is also continuing his research into standards of physical fitness of schoolboys and is opening a new line of investigation on the measurement of the ultra-violet rays of the atmosphere under the guidance of Dr. Leonard Hill.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 30TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 219 (last week, 230); scarlet fever, 1639; diphtheria, 903; enteric fever, 37; pneumonia, 757; puerperal fever, 39; puerperal pyrexia, 103; cerebro-spinal when built, would be related to the child welfare activities, municipal and voluntary, of the city, just as many other child welfare activities are already related: the tenants would be selected in view of the need of benefit to young children in the families of the less well-paid wage-earner.

The Effect of Milk on School-children.

The delegates to the World's Dairy Congress held a conference in Edinburgh on July 5th. In the absence of Sir Leslie Mackenzie, Dr. Gerald Leighton, of the Scottish Board of Health, submitted a paper on Milk Consumption and the Growth of School-children, based on experimental findings (see THE LANCET, 1928, i., 202). In November, 1926, the Scottish Board of Health set up a committee to test the effect on 1400 school-children in Peterhead, Aberdeen, Dundee, Edinburgh, Glasgow, Paisley, and Greenock, of a daily ration of milk in addition to their ordinary diet. The experiment has been carefully devised to test the nutrition value of milk, separated milk, and a control food of equal caloric value; the ages of the children tested were from 5 to 13 years. All the children lived at home under the ordinary conditions of Scottish working-class families. The investigation is still in progress, but from the data already available the following conclusions could be drawn:—

(1) The addition of milk to the diet of children of school age during the period under review has been accompanied by an increased rate of growth as indicated by an increase in both height and weight of 20 per cent. greater than that in children not receiving the extra milk.

(2) This increase in the rate of growth has been accompanied by an improvement in the general condition of many of the children receiving milk.

(3) Separated milk is of great value for promoting growth. Its nutritive value for children of school age would appear to be underestimated.

The reports indicated that the children receiving milk appeared to be in better general condition than those who did not receive it. On the whole they had glossier hair, clearer complexions, and even held themselves more erect. The most marked improvement was shown in those children who had been in poor condition at the beginning of the investigation.

Award of the Neiller Prize.

On July 2nd, at a meeting of the Royal Society of Edinburgh, Principal Sir Alfred Ewing, the President, presented the Neiller prize for the period 1925–27 to Prof. Arthur Robinson, professor of anatomy in the University of Edinburgh. The President recalled the fact that, early in his career as an anatomist, Prof. Robinson turned his attention to problems of mammalian embryology, and his first work on the subject was published in 1888. Since that time a series of important papers had appeared from his pen dealing, for the most part, with the development of individual organs in man and other mammals. Of special importance and value were those papers dealing with the early stages of development of mammalian ova. Two of the important conclusions, formulated on the evidence relating to ovarian follicles in the ferret, were afterwards verified in other mammals by the experiments of Prof. Edgar Allen, of the University of Missouri, and by other investigators. During the study of the follicles, Robinson's attention was drawn to the occurrence of prenatal death; with the aid of his own material, supplemented by data provided by the Board of Agriculture for Scotland, he was able to prove that prenatal death occurred with great frequency from causes other than external agencies. The Neiller prize was awarded to him for his recent work in comparative mammalian embryology, and in recognition of his published work extending over a period of 40 years.

Academic News.

The Court of the University of Edinburgh have approved a scheme of rearrangement of the curriculum of medical students in their third year by which the courses now given in two terms will be spread over three. This applies to the systematic courses in medicine and surgery, and to the theoretical and practical courses in pathology, bacteriology, materia medica, and therapeutics. The class examinations will be rearranged accordingly. No increase, either of the total number of meetings of the classes or of the amount of fees payable by the students, is involved.

In consequence of the rearrangement of the curriculum for the Diploma in Tropical Medicine and Hygiene, the diploma is now recognised as a qualification for the posts of junior public health officer in the Colonial Medical Service.

At the recent graduation ceremony at the University of St. Andrews, the Principal referred to the scheme for providing residential entrance scholarships. When the system was fully operative, he said, a steady succession of selected students, unharassed by financial anxiety, would have the opportunity of a Scottish University education, supplemented by the benefits of collegiate residence. The list of these scholarships had recently been increased by an additional award. The firm of Messrs. Tullis, Russell and Co., to which Dr. David Russell belonged, had agreed to contribute £100 annually towards the maintenance of a scholar at St. Andrews, preference to be given to students coming from central Fifeshire.

Public Health Services.

ANOTHER CASE OF ALLEGED OVER-PRESCRIBING BY A PANEL PRACTITIONER.

THE East Sussex Insurance Committee at its meeting on July 3rd had before it a report from its Medical Service Subcommittee dealing with the investigation of prescribing by insurance practitioners and the effect on the medical service of the action of the Regional Medical Officer of the Ministry of Health in criticising the prescribing of a doctor in East Sussex. The facts were similar to those stated in a previous case, some particulars of which were given in THE LANCET of April 14th last (p. 776). It appears that as the result of objection taken by the R.M.O. on general grounds to the cost of a certain proprietary preparation of colloidal iron combined with malt extract, the doctor in question had ceased to order it for his insured patients. The question was raised by a patient who was accepted by the doctor after the period with which the R.M.O. was dealing, so that the latter could not have had before him details of the particular case.

Reviewing the facts, the subcommittee states its opinion that this case confirms the impression derived from the previous case—namely, that the action of the R.M.O. has had the effect of unduly restricting the discretion of medical practitioners in prescribing medicines for their patients, and has tended to create an impression that the insurance medical service is inferior to that rendered to private patients. The procedure laid down by the Regulations in regard to the investigation of prescribing, the rights thereunder both of practitioners and insured persons, and the duties of practitioners, were fully set out in the previous report, and it appears that the statements made and conclusions drawn in that report have not been challenged. The subcommittee therefore recommends the Insurance Committee to inform the practitioner that, in the opinion of the Committee, he should not cease to prescribe for his insurance patients drugs which he believes to be reasonably necessary for their adequate treatment, unless and until the Panel Committee, or the appropriate tribunal on appeal, has decided that the supply of these drugs imposes a cost upon insurance funds which is in excess of what is reasonably necessary for such adequate treatment.

It was decided to raise the question of the principles involved at the meeting of the National Association of Insurance Committees to be held in London next October.

and difficulties of the general medical practitioner. Having been approached on the matter, we venture to solicit the support of the profession as two general practitioners representing industrial and rural areas respectively. We are both in the active pursuit of our profession, and have had a good deal of experience of administrative and medico-political work, which we hope would be of value if the profession should see fit to endorse our candidature. One of us (J. W. Bone) has had 32 years in general practice, private and contract, in the industrial area of Luton, has served on the Insurance Acts Committee for five years, and at the present time has the honour to be a member of the Council of the British Medical Association and chairman of its Medico-Political Committee. The other (E. K. Le Fleming) is familiar with other aspects of private and contract practice through 27 years' work in the rural area of Wimborne; whilst in addition to serving on the Council of the British Medical Association and the Insurance Acts Committee he has been honoured by the confidence of the insurance practitioners for the past five years as chairman of the Conference of Local Medical and Panel Committees of the United Kingdom.

Our experience in interpreting the collective views of our fellow practitioners and our willingness to devote whatever time and energy may be necessary to the proper fulfilment of the duties of a Direct Representative embolden us to solicit the support of the profession generally.

We are, Sirs, yours faithfully,
JOHN W. BONE.
July 7th, 1928. E. K. LE FLEMING.

NASO-PHARYNGEAL INFECTIONS AND EPIDEMIC JAUNDICE.

To the Editor of THE LANCET.

SIR,—In your issue of June 30th you publish a report of a discussion on naso-pharyngeal epidemics in public schools and an interesting leading article on epidemic jaundice in Great Britain. I have already in communications to the medical journals expressed my views as to the ætiology of the common cold, pointing out that the bacteriological aspect of these conditions does not cover the whole question; in fact, that bacteria may not be the primary agent at all, but that there is an underlying biochemical aspect which may be more essential. Organisms which were formerly harmless saprophytes may become pathogenic and infective, as a result of the disturbed biochemistry of the intestine, liver, and blood stream. Routine examination of the urine of people in ill-health has shown me the frequent occurrence, about and prior to a catarrhal season, of cases showing evidence of disturbed intestinal hepatic function, as indicated by the presence of indican, bile oxalates, and other bodies in the urine. The finding of similar evidence in many patients with catarrhal colds (probably these might be regarded as carriers) led me to think that the metabolic disturbance was the underlying cause of the activation of the organisms in the nose and throat. It is difficult to be dogmatic on this point, since one is not called to see these patients until the catarrhal attack develops; but I have had suggestive cases. One in particular who came to me in the height of summer because he was out of sorts. Examination did not reveal much wrong objectively, except that the urine contained bile. Treatment directed to this condition—ammonium chloride with alkalies—resulted on the third or fourth day after in his developing an acute fulminating catarrhal cold.

Recent American writers have been leaning to this metabolic aspect of the common cold and have claimed that it is due to a mild acidosis; and that they could precipitate an attack by the administration of calcium chloride or ammonium chloride. One cannot subscribe to this view entirely, since many patients take these drugs without evincing any signs of a cold; but their exhibition, when there is an underlying hepatic disturbance, may precipitate an attack.

There is probably some disturbance of the blood calcium as well in patients who get colds. Dr. J. A. Glover evidently had this metabolic aspect of the question in view when he recommended the inclusion in the diet of oranges, vegetables, salads, and watercress. The border-line between these cases of colds with disturbed hepatic function and those of epidemic catarrhal jaundice seems to me slight. I do not refer to those cases of jaundice definitely due to the *Leptospira icterohæmorrhagiæ*. I agree with Buchanan and Ross, quoted in your leading article, when they propose a bacteriological examination of the naso-pharynx and intestine in cases of epidemic jaundice. I would go further and suggest that not only bacteriological but biochemical investigation is required. In epidemics of catarrhal colds, or influenza, I have often wondered to what extent the jaundice associated with some of those cases was primarily due to the catarrhal organisms, or to a previous hepatic disturbance caused by some bowel organism—e.g., *B. coli*, which has become pathogenic. It is not easy to explain the fact that organisms in the nose and throat seem only sometimes to become pathogenic. My reading of it is that the soil has been prepared for them by metabolic and biochemical disturbances through atmospheric conditions, improper diet, overcrowding, insufficient fresh air and exercise, so that it is easy for activated organisms to find suitable soil when propagated by droplet infection. This droplet infection does not explain the numerous cases of colds which seem to spring up perhaps on the same day, at the very start of a catarrhal season, often in scattered parts of the town and country, and in people who have not been exposed to infection, but suggests auto-activation. The special frequency of post-operative pneumonia in cases of gall-bladder disease, gastric and duodenal ulcers, where the toxæmia factor is always more or less in evidence, is an allied problem which demands investigation.

I am, Sir, yours faithfully,
R. CHALMERS, M.D., F.R.C.S.E.
Darlington, June 30th, 1928.

"MANSON HOUSE."

To the Editor of THE LANCET.

SIR,—In the report in your issue of June 30th on the twenty-first anniversary dinner of this society Dr. Andrew Balfour is quoted as saying that "over £3000 had been raised towards the provision of a manson house for the Society." The verbatim report before me reads, "I should like to speak of the Manson Fund to provide what is going to be called possibly 'Manson House.' I say possibly because there is a distinguished member of our Council who has so little faith in the sobriety of his fellow Fellows that he feels that 'Manson House' might be mistaken for the building near the Bank or some celestial habitation, and he has proposed that it should be called 'Patrick Manson House' to prevent any such difficulty. I hope it will be called 'Patrick Manson House.'" Comment is not required.

I am, Sir, yours faithfully,
CLAYTON LANE,
Joint. Hon. Secretary, Royal Society of Tropical Medicine and Hygiene.
11, Chandos-street, Cavendish-square, London, W.,
July 4th, 1928.

LIVER TREATMENT IN PERNICIOUS ANÆMIA.

To the Editor of THE LANCET.

SIR,—Dr. J. H. Anderson in your issue of March 31st (p. 674) wishes to know if Orientals have long been using powdered liver for pernicious anæmia. It may interest him to learn that desiccated flesh of a carnivorous crow has for ages been used by the Indian *vaid* (herbalist) for a condition allied to fever, 9 ; acute poliomyelitis, 4 ; encephalitis lethargica, 20 ; dysentery, 7 ; ophthalmia neonatorum, 111. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified from the following 20 counties : London, 12 ; Bedford, 2 ; Derby, 23 ; Durham, 49 ; Lancaster, 10 ; Middlesex, 1 ; Norfolk, 1 ; Northampton, 1 ; Northumberland, 19 ; Nottingham, 8 : Salop, 1 ; Stafford, 9 ; Surrey, 2 ; Sussex West, 1 ; Warwick, 3 : Yorks, North Riding, 5 ; West Riding, 38 ; Brecknock, 1 ; Glamorgan, 18 ; Monmouth, 15.

The number of patients in the Infectious Hospitals of the Metropolitan Asylums Board on July 3rd–4th was as follows :—Small-pox, 58 under treatment, 2 under observation ; scarlet fever, 1760 ; diphtheria, 1909 ; enteric fever, 16 ; measles, 520 ; [illegible] eral fever, 16 (plus 14 babies) [illegible] poliomyelitis, 1 ; " other dise [illegible] Hospital there were 18 babies (plus 15 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (1) from enteric fever, 31 (7) from measles, 5 (0) from scarlet fever, 24 (1) from whooping-cough, 29 (4) from diphtheria, 45 (10) from diarrhœa and enteritis under two years, and 31 (4) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London occurred at Newport (Mon.), and Cardiff. Of the 24 fatal cases of measles outside London, 5 were reported from Liverpool, 4 from Newcastle-on-Tyne, and 3 each from Birmingham and Middlesbrough. Of the 23 fatal cases of whooping-cough outside London 6 were reported from Birmingham and 3 from Liverpool. During the same week Glasgow reported 6 deaths from whooping-cough.

The number of stillbirths registered during the week was 333 in the great towns (corresponding to a rate of 50 per 1000 births), including 61 in London.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. A. R. Schofield to be Surg. Capt.

Surg. Lt. H. M. Devane to be Surg. Lt.-Comdr.

The following appointments are notified :—Surg. Comdrs. : E. B. Kenny to *President* for R.N. Recruiting Headquarters ; G. D. Walsh to *Pembroke* for R.M. Infirmary, Chatham ; A. G. Valpy French to *Pembroke* for R.N. Hospl., Chatham ; and J. G. Boal to *Berwick*. Surg. Lts. : W. V. Beach to *Wallace* ; A. L. McDonnell to *Vivid* for R.N. Hospl., Plymouth ; M. Clifford to *Renown* ; and J. M. Sloane to *Pembroke* for R.N. Hospl., Great Yarmouth. Surg. Lt.-Comdr. (D.) : D. Paterson to *Egmont* for R.N. Hospl., Malta. Surg. Lt. (D.) : D. Barker to *Victory* for R.M. Infirmary, Portsmouth, and to *Victory* for R.N. Barracks, Portsmouth.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. W. C. Macartney to be Surg. Comdr.

ROYAL ARMY MEDICAL CORPS.

Maj. D. W. Bruce retires, receiving a gratuity.

W. A. Lethem (late Maj., R.A.M.C., Mila.) to be Maj.

Capt. D. P. H. Gardiner to be Maj.

Capt. A. U. Webster relinquishes his commn.

TERRITORIAL ARMY RESERVE.

Capt. J. C. Knox, from the Active List, to be Capt.

ROYAL AIR FORCE.

Squadron Leader R. H. Knowles to be Wing Comdr.

Flight Lt. C. A. E. I. Brownlee to be hon. Squadron Leader.

Flying Officer L. Freeman is promoted to the rank of Flight Lt.

Flight Lt. E. E. Isaac relinquishes his temporary commn. on completion of service and is permitted to retain his rank.

COLONIAL MEDICAL SERVICES.

Capt. R. Nixon, M.O., and Mr. H. H. B. Follit, M.O., Nyasaland, to be Sen. San. Offs. in the Tanganyika Territory. Mr. H. P. S. Gillette is appointed M.O., St. Lucia, Windward Islands.

Correspondence.

"Audi alteram partem."

DIRECT REPRESENTATION ON THE GENERAL MEDICAL COUNCIL.

To the Editor of THE LANCET.

SIR,—As the university professorial and consulting element is so fully in evidence on the General Medical Council, it is fitting that the Direct Representatives of the profession should be general practitioners. With this I am absolutely in accord. At a meeting of the profession in my division (Kensington) it was resolved to put forward my name as a candidate for nomination at the coming election. I am, and have been, for the whole of my professional career a general practitioner pure and simple. I served for five years on the General Medical Council as a Direct Representative, and therefore am thoroughly conversant with its methods and procedure, so that if I were re-elected I could at once take my place in its deliberations without having to serve any apprenticeship. In the British Medical Association I have held every possible office, except that of Treasurer and Chairman of Council, having been chairman of my division, president of my branch, member of the General Council for 17 years, chairman of the Representative Body 1915–18, chairman of the Medico-Political Committee for seven years, president of a section at the general meeting in 1920, member, chairman, and vice-chairman of numerous special and "ad hoc" committees, and have also represented the Association on many outside bodies, in some cases for many years. During the whole of this time, both within the British Medical Association, and also very largely as a member of outside councils, I have done my utmost to further the honour and best interests of my profession. For these reasons I have allowed my name to go forward as a candidate, and I appeal to all members of the profession for their support. Should I be re-elected I should do my very best to carry out the duties of the post as I did when I was a member some years ago, when I never missed a single session or sitting of the Council.

I am, Sir, yours faithfully,

E. B. TURNER.

London, July 7th, 1928.

To the Editor of THE LANCET.

SIR,—Owing to the lamented death of Dr. J. A. Macdonald of Taunton, and to the resignation of Sir Robert Bolam (who has been appointed representative for the University of Durham), there will be, in October, an election of two Direct Representatives on the General Medical Council by the medical practitioners of England and Wales. It is understood that meetings of the profession will shortly be called in all parts of the country to consider nominations for such representatives.

The educational side of the Council's work is well cared for by the representatives of the various universities and licensing bodies. Many of these representatives, too, are thoroughly conversant with the special problems of consultant practice, being themselves actively working in that sphere.

Only two general practitioners at the moment have seats on the General Medical Council. The penal cases, which absorb so large a proportion of the Council's time, deal often with situations arising in the lives of general practitioners, as is only natural seeing that general practitioners constitute the bulk of the profession. The preparation of the medical student for ordinary family practice demands emphasis in the regulations laid down for his education, and for this the advice of general practitioners ought to be useful.

We are advised of a strong feeling that opportunity should be taken of this by-election to place upon the General Medical Council two Direct Representatives who have the closest possible touch with the problems own experience. I have written from the standpoint of my own experience, but have reason to believe that surgeons are victimized at least as frequently as are physicians! Obviously the practice is one that can hardly be suppressed by individual action. An analogous situation occurs sometimes, when the employers, the friends or the relatives of a panel patient ask the panel doctor to meet a specialist in consultation. The panel doctor does not desire to absent himself from the consultant's visit, but may spend time without hope of fee. He sometimes asks the consultant—who is paid by the employers—to "do something for" him in the matter. I have, in such a case, suggested that a fee should be paid directly in a complimentary way by the employers. But I was once asked by the panel doctor to add £2 2s. to my "account" for his sake!

I may perhaps say, in conclusion, that in my view the General Medical Council might well make a pronouncement to the effect that payments should always be made directly to the consultant and not through any intermediary, or that the amount of the fee should be stated by the consultant to the person responsible for the fee. It seems to me, however, that panel practitioners have a real grievance in not receiving the proper fee for being present at a consultation desired by the employers. This does not excuse an underhand method of obtaining a fee, though the existence of this real grievance has thus become apparent to me.

Let us hope that the publicity given to my experiences, which I know are shared by certain of my colleagues, will put an end to such practices.

I am, Sir, yours faithfully,

June 23rd, 1928. NEMO.

⁂ This letter reveals the existence of what is rightly styled an obnoxious practice. It is one that should receive immediate attention. Whether the General Medical Council would consider it any part of its duties or responsibilities to issue such a pronouncement as is sought, even in the form of a warning note, seems doubtful. The disciplinary powers of the Council would have to be set in action against those who disobeyed the pronouncement, or the Council would be stultified, and those powers can only be exercised if unimpeachable evidence were forthcoming. Publicity anyhow must act as a deterrent, opening the eyes of the public to a trick by which both they and a section of the medical profession may be victimised, although we hope that Nemo's experience is not a common one. If it is a fact that no provision can be made for the payment of panel doctors attending a consultation, the position should be altered.—ED. L.

"THE GREAT PROBLEM AND THE EVIDENCE FOR ITS SOLUTION."

To the Editor of THE LANCET.

SIR,—I was sorry to see in the honoured columns of THE LANCET a review which treated with contempt the recent book of Dr. Lindsay Johnson, "The Great Problem," in which he discusses spiritualism. Lindsay Johnson is a very highly qualified man and his views are shared by the vast majority of those who have actually investigated the subject. The opinion of those who have not is worth less. A century ago the medical profession stultified itself by its ridicule of mesmerism which it now uses as a powerful ally. It is sad to see it placing itself in the same false position towards spiritualism, for history will most certainly repeat itself.

As to the quality of the advertisements in psychic papers I agree with the reviewer that they might be improved, but is it reasonable to judge a vast subject not by the writings of a Lodge, a Crookes, a Wallace, a Richet, or a Flammarion, but by the advertisements in a few small papers?

I am, Sir, yours faithfully,

ARTHUR CONAN DOYLE, M.D. Edin.

Buckingham Palace Mansions, S.W.,
July 9th, 1928.

"IN AN INTERVIEW."

To the Editor of THE LANCET.

SIR,—Extracts from a paper by me on tuberculosis have been published by a newspaper and I should explain that no information of any sort was given by me, and that the extracts are based upon an advance copy of the *British Journal of Tuberculosis* obtained from the publishers. The account of the boxer was, I understand, obtained by the paper in the usual routine of news collecting; it certainly did not emanate from me. My real object in writing is to draw attention to the fact that another newspaper stated that I said "in an interview" that the treatment was still on its trial, or words to that effect. The "interview" actually consisted of asking me over the 'phone for an interview, and my reply that I could not possibly grant it, and that everything I had to say I had said in the *British Journal of Tuberculosis*.

I am, Sir, yours faithfully,

Manchester, July 10th, 1928. C. E. JENKINS.

THE TALE OF MEDICAL RESEARCH.

AN annotation published in our issue of June 30th under this heading has brought a communication from Mr. S. C. Turner, the Chairman of the Antivivisection (Battersea General) Hospital, protesting that statements made at the annual meeting of the Research Defence Society were misleading. Mr. Turner refers chiefly to the public announcement of Mr. Peart who, he says, remained surgeon to the hospital for four years after the situation was clear, while he had ceased to be honorary surgeon for two years when he made his announcement. Our words contained nothing to the contrary, and it is difficult to say why Mr. Peart should not be allowed to choose his own date for publicity, or to see in what way his period of silence has damaged the hospital.

UNIVERSITY OF ST. ANDREWS.—The Macewen prize in surgery has been awarded to Mr. Thomas Lawson McEwan, who is a graduate in medicine and in science of the University.

HOSPITALS AND THE MIDDLE CLASSES.—It is understood that the Pay Bed Committee of King Edward's Hospital Fund for London, appointed last year, will shortly issue its report on hospital accommodation for the professional and middle classes. The committee suffered a serious loss in the death of its chairman, Lord Hambleden, who, owing to his last illness, was unable to attend the deliberative meetings, though he had presided at the meetings when evidence was taken. The committee has devoted special attention to the question of voluntary insurance schemes.

BRITISH HUMANE ASSOCIATION'S LONDON CLINIC.—The officers of this clinic in Ranelagh-road, S.W., entertained several hundred medical visitors at a demonstration of therapeutic methods on the evening of July 10th. The institution was opened early this year by the British Humane Association; it succeeded the clinic in Tufton-street, and is one of the largest physiotherapeutic establishments in the world, its capacity being over a thousand patients a day. The ground floor houses offices and the saline and aromatic inhalation rooms, where patients with bronchial and pulmonary affections may breathe medicated air. On the first floor are the electrical and diathermy wards and a large tungsten-arc room. Almost the whole of the second floor is occupied by the mercury-vapour ward, and the whole clinic is elaborately equipped. The visitors saw the apparatus at work, and at a meeting over which Sir Bruce Bruce-Porter presided they listened to papers by Dr. Howard Humphris, who spoke on heliotherapy in general, by Dr. R. Deck, who gave an account of some unusual cases in tungsten-arc practice, and by Dr. Courtenay Mason, who explained the technique of inhalation treatment. The situation of the clinic is excellent, for it has a large poor population at its doors, and is accessible to south as well as to north London. Patients pay what they can afford, and it is stated that half of them make no payment. The clinic is maintained, as it was founded and equipped, at the expense of Mr. Campbell Johnston.

pernicious anæmia. Unfortunately, the nomenclature of diseases in the *Unani* system of medicine is rather defective, so that it is possible all the cases of anæmia thus treated may not have been of pernicious variety. Nevertheless, the fact that desiccated flesh including liver of a carnivorous crow has been highly recommended in the *Unani* system of medicine for anæmia makes it amply clear that the salutary effects of this treatment were well known to Orientals. To make further sure about this I referred to the book of therapeutics in the possession of a local Baluch *vaid* and found that there was in it first a description with signs of identification of this crow which is termed "Zagchah." Then the author proceeded to describe in detail its therapeutic qualities and recommended its desiccated flesh for regeneration of pure blood (*khalis khun*) in the system.

I may also state that I have seen *vaids* using similar things, but the Western science which has put therapeutics on a sound basis of reason does not permit even in thought the use of such drugs in that crude form. I am tempted to mention the following case by way of amplification. One patient had an attack of renal colic and the *vaid*, who was called in, had a goat slaughtered of which he removed the kidneys and made the patient swallow the same immediately, while they were still dribbling with blood. The patient not only obtained prompt relief but has not had an attack thereafter during the last eight years.

I am, Sir, yours faithfully,

P. V. KARAMCHANDANI, M.B., I.M.S.;

In charge Indian Military Hospital, Pishin,

June 11th, 1928. Baluchistan (India).

PERICARDIAL KNOCK.

To the Editor of THE LANCET.

SIR,—The communications on this subject from Dr. W. A. Lister and Dr. H. E. Symes-Thompson recall to my mind a case apparently unconnected with intrathoracic disease or injury. Some eight months ago a panel patient employed as manservant in London came to the south coast to convalesce from "neurasthenia." At the first consultation he gave a history of "shell-shock," and while recounting his then troubles he burst out crying. Five days later he called to apologise for having "made a fool of himself." He entered the consulting room in a very agitated state and said, "Do you hear my heart knocking, sir?" I was sitting at a distance of about five feet and the knock was distinctly audible for fully 20 seconds, and then stopped quite suddenly when the patient seemed more composed. Neither at that time nor at any later date have I found any physical abnormality. Two months later his mental condition having improved the patient found employment as a postman.

I wish now that I had used the stethoscope while the sound was audible, but at the time I was more amused than scientific. In this case, whose only abnormality was extreme nervousness accentuated by a desire to apologise for supposed lack of manliness, why should the left pulmonary artery be obstructed?—the cause suggested by Dr. Lister.

I am, Sir, yours faithfully,

Bexhill-on-Sea, July 9th, 1928. JOHN KERR.

To the Editor of THE LANCET.

SIR,—Dr. Symes-Thompson suggests that the peculiarly loud heart sounds in his case of empyema arose in the pulmonary artery, and are due to either tension or distortion of that artery. He also compares them to the sounds produced when estimating the blood pressure auscultatively. May I point out that there is no evidence whatever (1) that the artery was under increased tension or distorted; (2) that an artery distorted or under increased tension can produce a sound. He admits that as soon as the fluid was liberated from the chest the heart sounds disappeared; such an admission seems to prove that the fluid had a good deal to do with the production of the sounds. Such a fluid is easily moved by the moving heart, and moving fluid is particularly prone, especially when confined, to give rise to a sound.

My theory regarding the heart sounds is that they are due to the movements of the pericardial fluid which take place normally under a negative pressure of 6 to 8 cm. of water. If Dr. Symes-Thompson will half fill a rubber foot-warmer and shake it slowly from end to end he will hear noises resembling those due to his empyemic fluid. The comparison to the sounds heard when estimating blood pressure assumes that these sounds are produced by the vibrations in that artery, but a reference to my letter on the subject in your issue of May 12th last may tend to show that such an assumption is incorrect.

I am, Sir, yours faithfully,

Swansea, July 10th, 1928. G. ARBOUR STEPHENS.

BRITISH EMPIRE CANCER CAMPAIGN.

To the Editor of THE LANCET.

SIR,—I see that I am still stated to be Chairman of the Management Committee of the *Cancer Review* in the July number just published, and in the annual report of the British Empire Cancer Campaign. This is no longer the case as I resigned more than a month ago from this and the other Committees of the British Empire Cancer Campaign on which I had been serving. I shall therefore be obliged if any communications meant for me be addressed to 8, Queen-square, W.C.1.

I am, Sir, yours faithfully,

J. A. MURRAY,

Director, Imperial Cancer Research Fund.

London, July 6th, 1928.

AN OBNOXIOUS PRACTICE.

To the Editor of THE LANCET.

SIR,—It is right, I think, that attention should be called publicly to an obnoxious practice which is being rapidly extended in certain parts of London. I speak from facts within my own knowledge and with a complete sense of responsibility. I enclose my card for your information, but I do not sign my name, for some reasons that may be obvious, and for at least one that may not be obvious—namely, that I have no desire to appear more righteous than any of my neighbours. Still, I shall have no hesitation in giving my name if called upon, inasmuch as at present I feel intensely insulted at having been made repeatedly a party to a vulgar and dishonest trick. The insult is to my intelligence. I feel that I have been chosen as a dupe rather than as an accomplice. This is the sort of thing that happens. A physician is summoned in consultation, usually by telephone, on behalf of a practitioner whom he may or may not know. The message is to the effect that a fee of (say) £5 5*s.* will be paid to the physician. Or he is told that only £5 5*s.* can be paid, and he is asked to accept this. The consultation takes place, after which the practitioner leaves the room saying that he will see about the fee. He returns with the relatives for the usual interview and subsequently, perhaps outside the house, hands the consultant £5 5*s.*; but £2 2*s.* has been kept for himself, while the relatives believed that the consultant's fee was £7 7*s.* Sometimes the practitioner produces his own cheque at the consultation, for the agreed £5 5*s.*, receiving the £7 7*s.* from the family. There are several variants of the trick, all equally dishonourable, but not all equally clever, and two sources of weakness are obvious. One is that the relatives may insist on paying the consultant the full £7 7*s.*; the other is that the same consultant may be called in twice, the second time at the patient's own request, and with an honourable and straightforward practitioner in attendance. Discussion about the fee may lead to a reference to the previous fee, when the deception may be exposed. This has happened in my

Lead Poisoning Among Painters.

Lord **Henry Cavendish-Bentinck** asked the Home Secretary the number of cases of lead poisoning among painters for January, February, March, April and May, 1927, and for the same months of 1928; and what steps were taken to see that the regulations under the Lead Paints Act were being enforced.—Sir **W. Joynson-Hicks** replied: The number of cases reported for the first five months of 1927 was 33, and for the same period in 1928, 40. All cases of lead poisoning and complaints are fully investigated by the factory inspectors. It has always been recognised that on account of the special conditions under which the industry is carried on it would be necessary to rely to a large extent on the coöperation of the industry itself for securing general compliance with the regulations. With this object conferences were arranged with the employers' and operatives' associations, and I am glad to state that both sides have taken steps to impress on their members the importance of a strict observance of the regulations, and have promised to assist the department in every possible way.

Grants in Aid of Health Services.

Sir **Nicholas Grattan-Doyle** asked the Secretary to the Treasury whether he would state for the latest available year the amounts of the following grants to local authorities in England and Wales: percentage grants in aid of the following health services; tuberculosis, maternity, and child welfare; welfare of the blind; venereal disease; and mental deficiency.—Mr. **Chamberlain** replied: The following are the percentage grants in respect of the undermentioned health services:—

	£
Tuberculosis	1,640,098
Maternity and child welfare	767,082
Welfare of the blind	3,195
Venereal disease	302,158
Mental deficiency	505,642
	£3,218,175

The foregoing figures do not include the undermentioned amounts granted to voluntary associations:—

	£
Maternity and child welfare	197,119
Welfare of the blind	112,082
Venereal disease	152
Mental deficiency	8,422
	£317,775

Maternal Mortality Figures.

Mr. **Groves** asked the Minister of Health the maternal mortality figures for England and Wales for 1924 to 1927, and for the county borough of West Ham for the same periods.—Mr. **Chamberlain** replied: The following table shows the numbers of deaths classified as due to childbirth, and rates per 1000 live births, for England and Wales and for West Ham county borough, for the years 1924–27:—

Deaths due to childbirth—

England and Wales.			West Ham county borough.	
Year.	No.	Per 1000 live births.	No.	Per 1000 live births.
1924 ..	2847	3·90	12	1·66
1925 ..	2900	4·08	20	2·85
1926 ..	2860	4·12	13	1·94
1927* ..	2690	4·11	18	3·00

* Provisional figures.

Anthrax in Human Beings and in Foreign Imported Skins.

Dr. **Salter** asked the Home Secretary the number of cases of anthrax which had occurred in human beings and had been notified to his department during each of the last five years; the number of cases in which the disease proved fatal in each of those years; and the number of cases in which the infection was traced to its source or origin.—Sir **W. Joynson-Hicks** replied: The numbers in the years 1923 to 1927 were 50, 45, 48, 42, and 35 respectively, of which 8, 4, 10, 4, and 3 were fatal. In all except 7 of the cases the patient was found to have been in contact with materials likely to be infected with anthrax.

Dr. **Salter** asked the Home Secretary whether his department had investigated the serious outbreaks of anthrax at Newcastle, Warrington, and Bolton which had occurred this year; if so, what were the results of the inquiry; whether he had considered amending the regulations dealing with the treatment of hides and skins; whether he proposed to enforce arrangements for the efficient disinfection of foreign imported skins; and whether he intended to issue a welfare order in connexion with tanning and the leather industry generally.—Sir **William Joynson-Hicks** replied: Yes, Sir. Each of the cases—eight altogether—reported this year from the three places mentioned has been investigated. It was found that in every case except one the workman had been in contact with hides imported from China. The question of further precautions has for some time past been under discussion with the employers' and workers' associations, but it is agreed that the only measure likely to be effective would be disinfection. Investigations for this purpose were commenced some time ago by the United Tanners Federation, and are being actively pursued, but I regret that no satisfactory method has yet been worked out. The issue of a draft welfare order is also under consideration, and I hope that a decision will be reached very shortly.

MONDAY, JULY 9TH.

Report of Committee on Mental Deficiency.

Mr. **Harris** asked the President of the Board of Education when the Report of the Special Committee set up in 1923 to investigate various problems relating to mental deficiency will be ready; and whether it was proposed to issue the Report as a public document.—The Duchess of **Atholl** replied: My right hon. friend hopes that the Report will be available before the end of the year and that it will be published, but he cannot, of course, give an undertaking at this stage.

The Pace Case and Coroners' Powers.

Mr. **Purcell** asked the Prime Minister whether he would consider the matter of making adequate compensation to Mrs. Pace, who had been under police surveillance since Jan. 10th last, had been subjected to severe examination by Scotland Yard officers and a protracted coroner's inquiry, arrested on a charge of murder, kept in prison for a lengthy period, and compelled to undergo all the anguish and terrors on the capital charge, and who had now been released, no case having been proved against her; further, if the right hon. gentleman would institute a public inquiry into the position and powers of coroners, and whether, in the public interest, in view of the heavy expense involved in ensuring adequate legal defence, provision could not be made to guarantee to poor persons, particularly those implicated in charges involving life and death, the fullest and best legal and technical defence free from all cost.—Sir **Thomas Inskip** (Attorney-General) replied: This question raises three very important matters—firstly, the question of compensation to Mrs. Pace; secondly, the proposal to hold a public inquiry into the position of coroners; and, thirdly, a proposal to provide legal assistance for accused persons. In regard to the two last questions I am not now prepared to give any answer, except that these matters will receive due consideration by the proper authorities. With regard to the question of compensation to Mrs. Pace, she has been acquitted by a jury after a very careful and admittedly fair trial. There has been no departure from the ordinary course of the administration of justice. In these circumstances it must be undesirable, in the interests of justice generally, that any proposal for compensation in this case should be entertained.

Mr. **Morris** asked if the Attorney-General proposed to introduce an amendment of the law relating to coroners' juries, and limiting the power of such juries to inquiry into the cause of death only, leaving the verdict to be inquired into by the magisterial courts and the Assize Court.

Mr. **Macpherson** asked if the Attorney-General meant that the Government proposed to institute an inquiry into the question of the coroners' inquisition. If so, would he bear in mind that, in Scotland, there were no coroners and no coroners' inquisitions, and that the progress of justice was always safe and efficient

Sir T. **Inskip**: I did not say that the Government are contemplating an inquiry into the question of coroners' inquisitions. What I said was, that the question which has been submitted, at very short notice, will receive due consideration from the proper authorities, and everything would be borne in mind.

Mr. **Morris** said that quite apart from the facts of this particular case, there were two verdicts on record: that of the coroner's jury, finding the person guilty of murder, and the verdict reversing that at the Assize Court. That revealed an illogical state of the law. Was it not desirable, therefore, to amend the law, so as to limit the findings of the coroner's jury to the cause of death alone?

Sir T. **Inskip**: Whether that is desirable or not, it is not a proper subject of question and answer, without due opportunity for considering these important matters.

TUESDAY, JULY 10TH.

Hospitals and Motor Accidents.

Mr. **Hore-Belisha** asked the Minister of Transport whether, in view of the heavy and increasing burden imposed upon voluntary hospitals in the treatment and maintenance

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

REORGANISATION OF OFFICES (SCOTLAND) BILL.

ON Monday, July 9th, the Reorganisation of Offices (Scotland) Bill was considered in the House of Commons on Report and read the third time by 175 votes to 78. This is a measure which provides that the powers and duties of the Scottish Board of Health, the Board of Agriculture for Scotland, and the Prison Commissioners for Scotland shall cease to exist from the appointed day, and that their powers and duties shall be transferred to a Department of Health for Scotland, a Department of Agriculture for Scotland, and a Prisons Department for Scotland.

HOUSE OF LORDS;

MONDAY JULY 9TH.

Child Destruction Bill.

The Child Destruction Bill (formerly the Infanticide Bill) was considered in committee.

Lord DARLING formally moved that the amendments which had been made by the Select Committee to which the Bill had been referred should be agreed to. This was done, and the Bill passed through Committee.

Reading University Bill.

The Representation of the People (Reading University) Bill, a measure which gives the franchise to graduates of Reading University on the same lines as other universities, passed through Committee.

HOUSE OF COMMONS.

WEDNESDAY, JULY 4TH.

Rating of Hospitals.

Sir COOPER RAWSON asked the Minister of Health whether he had received any representations from local authorities or charitable organisations with regard to the effect of the operation of the Rating and Valuation Act of 1925 on hospitals and similar institutions; and whether he proposed to take any action in consequence.—Sir KINGSLEY WOOD replied: My right hon. friend has received communications on this subject from the British Hospitals Association and from the authorities of certain hospitals but not from local authorities. I can only refer to the reply which I gave on July 2nd.

Sir C. RAWSON asked if Sir Kingsley Wood was aware that the Sussex County Council had had their assessment raised from £100 to £1600, and if the assessment committees of the different localities were justified in making nominal assessments as they had done hitherto? If not, would the House have any opportunity of discussing the matter at an early date, as it affected so many hospitals all over the country?

Sir KINGSLEY WOOD said that if assessment committees were not acting properly and within the law there was a remedy by way of appeal.

Death of Two Factory Girls at Battersea.

Mr. WILLIAM THORNE asked the Home Secretary whether his attention had been called to the report of the Battersea coroner on the resumed inquest on two girls who died in hospital following illness they had contracted while employed at a scouring-powder works at Battersea; that the medical evidence showed that the cause of death was industrial silicosis and not tuberculosis, as at first diagnosed; that three girls and a boy employed at the same works had died since Jan. 25th, 1927; and if he would take any action in the matter in consequence of the dangerous nature of the work in handling the powder.—Sir W. JOYNSON-HICKS replied: Yes, Sir. A full report has been submitted to me by the Medical Inspector of Factories, who attended the inquest and investigated the circumstances. In the opinion of the medical inspectors these cases originated when the mixing and filling of the powder were done by hand. At the beginning of 1927, on the instructions of the district inspector of factories, mechanical methods of working were introduced. The plant since that date has been totally enclosed, and exhaust ventilation applied to all points where dust is liable to escape. I am advised that the present arrangements should prove effective, but they will continue to receive close attention.

Organised Draws for Hospital Funds.

Sir COOPER RAWSON asked the Home Secretary why a voluntarily organised draw on behalf of the funds of a Hove hospital was stopped by the Home Office while draws conducted on identical lines for other hospitals in Brighton and Hove had not been interfered with; and if an authoritative statement could be made for the guidance of those who organised these and similar functions on behalf of charities. —Sir W. JOYNSON-HICKS replied: The enforcement of the law relating to illegal lotteries is a matter for the local police and not for the Home Office. My attention was drawn to a public lottery at Hove in apparent contravention of the law, and I brought it to the notice of the local police. Had my attention been drawn to the other lotteries referred to, it would have been my duty to bring them also to the notice of the police. As I stated in reply to my hon. and gallant friend, the Member for Dulwich, on July 14th, public lotteries are definitely illegal, and the law does not discriminate between those promoted in aid of charity and other public lotteries. I have no authority to decide what is or is not a public lottery, but it is always open to the promoters of charities to consult the local police on the question whether any proposed lottery appears to contravene the law.

Sir C. RAWSON asked whether, as this particular question would deprive the hospitals in the constituency of Brighton and Hove of some £15,000 a year, the Home Secretary would persuade the Government to introduce legislation to remove some of the anomalies and stupidities of the existing law in regard to gaming.

Sir W. JOYNSON-HICKS said that he had already issued two memoranda on the subject of gaming. The law as regarded lotteries, however, was definite, and did not permit of any action by his department.

Sir C. RAWSON: Will the right hon. gentleman suggest an alteration of the law?

No reply was given to the question.

THURSDAY, JULY 5TH.

Provision for Mentally and Physically Defective Children.

Mr. HARRIS asked the President of the Board of Education how many local education authorities had provided no accommodation up to the present for mentally defective and physically defective children; and were there any authorities without accommodation who were making provision during the current educational triennium.—The Duchess of ATHOLL (Parliamentary Secretary to the Board of Education) replied: According to the information in the possession of my department, there are 240 local education authorities who have provided no special schools of their own for mentally defective children, and 257 who have provided no special schools of their own for physically defective children; but 131 of the former authorities and 221 of the latter send children of these types to special schools provided by other authorities or by voluntary managers, and some 200 authorities make provision for the orthopædic treatment of crippled children. In addition, about 50 authorities have arranged for the supervision of mentally defective children in their areas. As to the second part of the question, the Board already have before them proposals for the provision of five new schools for mentally defective children, and 28 new schools for physically defective children.

Insurance Patients and Vitamin Preparations.

Miss WILKINSON asked the Minister of Health whether he was aware that certain insurance committees had decided that insurance practitioners must not order for their patients vitamin preparations on the ground that they were not drugs but food, while other committees allowed doctors to prescribe vitamin preparations; and whether he could ensure that insurance patients were not deprived of such necessary products recognised by modern medical practice.—Mr. CHAMBERLAIN replied: The question whether any particular preparation can be regarded as a medicine within the meaning of the National Health Insurance Acts is one to be determined by the local insurance committee, and would only come before me formally on an appeal from their decision. I am, however, aware that there is a divergence of practice between committees on the point, and I am proposing to issue a statement for the purpose of assisting insurance practitioners and committees in their consideration of it in future.

Poor-law Medical Officers and Extra Remuneration.

Captain FAIRFAX asked the Minister of Health if he had received an appeal from the Norfolk vagrancy committee for assistance in providing extra remuneration for medical officers of poor-law institutions now called upon, by order of the Ministry, to examine all casuals for small-pox; and, in view of the fact that this work was outside the duties ordinarily performed by these doctors, whether he would undertake to defray all or part of the additional fees involved. —Mr. CHAMBERLAIN replied: The answer to the first part of my hon. and gallant friend's question is in the affirmative, and to the second part in the negative. There are no funds at my disposal out of which such a contribution as is suggested could be paid.

Royal College of Surgeons of England.—The annual election of Fellows into the Council was held on July 5th. There were 12 candidates for four vacancies, and the following were elected: Prof. R. E. Kelly (Liverpool), 446 votes; Mr. F. J. Steward (London), 409 votes; Mr. R. G. Hogarth (Nottingham), 407 votes; and Prof. L. P. Gamgee (Birmingham), 399 votes. The number of voting papers received was 1169.

University of London: *University College.*—Dr. John Kirk has been appointed demonstrator in the department of anatomy and embryology.

University of Birmingham.—At a Congregation held on June 30th the degree of M.D. was conferred on I. de B. Daly, J. F. Brailsford, and F. W. M. Lamb. The degrees of M.B. and Ch.B., and B.D.S. were conferred on the candidates whose names were given on p. 44 of our last issue as having passed the requisite examinations.—The Queen's scholarships for the third, fourth, and final year were awarded to K. S. Williams, W. C. Smallwood, and G. H. Knight respectively; the Ingleby scholarships to F. R. Roberts and A. B. Taylor, the Arthur Foxwell Memorial medal to A. B. Taylor, the Peter Thompson prize in anatomy to James Hardman, and the Samson Gamgee Memorial medal for surgery to G. H. Knight.

Dr. Frank Gower Gardner, of Oxford, Captain R.A.M.C. (T.) (ret.), has been elected County Director of the British Red Cross Society for Oxfordshire in place of Colonel Stanier Waller, resigned.

College of Nursing.—The College's petition for a Royal Charter, placed before the Privy Council by Sir Cooper Perry, has been successful.

It is announced that Dr. F. d'Herelle, who has recently been working in India on the treatment of cholera by bacteriophage, has been appointed professor of bacteriology at the Yale School of Medicine, Connecticut, U.S.A.

British Institute of Philosophical Studies.—The annual general meeting of this institute will be held at the Royal Society of Arts, 18, John-street, Adelphi, London, W.C., on Monday, July 16th, at 5.30 P.M. The Earl of Balfour will preside and deliver a short address. Other addresses will be given by Sir Robert Horne, Sir Martin Conway, and the chairman of the institute, Prof. L. T. Hobhouse.

International Congress of Physiology.—The thirteenth International Physiological Congress will meet at the Medical School of Harvard University, Boston, Massachusetts, from August 19th to 23rd, 1929. The Federation of American Societies for Experimental Biology will serve as hosts to the Congress, and Prof. William H. Howell, of Johns Hopkins University, will be the president. The arrangements for the Congress are in charge of Prof. Walter B. Cannon, of the Harvard Medical School, who is chairman of the Congress Bureau, and Prof. Edwin J. Cohn and Alfred C. Redfield, who are the secretaries.

Post-Graduate Courses in Paris.—Holiday courses will be held at the Clinique Médical de l'Hôtel-Dieu from Sept. 10th to 22nd, and from Oct. 1st to 13th, under the direction of Prof. P. Carnot and Prof. M. Villaret. The subjects will be, respectively, Recent Views of Diabetes and Hepatic Diseases, and Recent Views of Digestive Disorders. The interval will be spent in a visit to Vichy. A course on pediatrics will be held at the Clinique Médicale des Enfants, 149 rue de Sèvres, from July 26th to August 11th, under the direction of Prof. Nobécourt. Those wishing to attend any of these courses should communicate with the Secretary of the Faculty of Medicine (Guichet No. 4) of the University of Paris.

First International Congress of Oto-Laryngology.—This Congress takes place at Copenhagen on July 30th and 31st and August 1st, 1928, and intending visitors should send in their subscription without delay. This has been fixed at 30 Danish kroner per head, with the addition of 15 Danish kroner for every lady in the party, and payment can be made with an English cheque if this be dispatched at once to the hon. treasurer, Dr. Jorgen Moller, Vestre Boulevard 13, Copenhagen. On receipt of the subscription a programme will be dispatched from Denmark giving a list of the festivities and excursions in connexion with the Congress and a form on which should be entered an application for the tickets desired. The application form should be returned without delay to the Secretary-General, Dr. N. Rh. Blegvad, Nytorv 3, Copenhagen. Those who have not already secured hotel accommodation should apply at once to Bennett's Tourist Office, 45, Raadhuspladsen, Copenhagen V., while particulars and tickets for the journey can be obtained from Messrs. Bennett, 66, Haymarket, S.W. 1, and Messrs. Thos. Cook and Son, Berkeley-street, W. 1.

Prof. Share Jones, Professor of Veterinary Science at the University of Liverpool, has been appointed President of the Royal College of Veterinary Science.

Sanatorium's Change of Name.—Highfield Sanatorium, in Edge Lane Drive, Liverpool, will in future be known as Broadgreen Sanatorium.

Osteolysis in the Mouth.—We are informed that a series of photomicrographs by Dr. Arthur Hopewell-Smith, illustrative of the process of osteolysis as it occurs in the oral cavity, has been added to the annual exhibition of the Museum of the Royal College of Surgeons, Lincoln's Inn-fields, London, W.C. The exhibition will remain open until July 28th.

Extension of Jenny Lind Hospital.—Mrs. Raymond Maude, daughter of the foundress, has laid the foundation-stone of a new out-patient and special department block of this Norwich hospital for children. The extension, which is being partially paid for by a grant from the Norwich Joint Hospitals and War Memorial Fund, includes accommodation for the electrical, X ray, and massage departments. Mrs. Maude also opened Pym House, a nurses' hostel, formed by throwing two houses into one, which has been provided from a bequest by the late Mrs. Radford Pym.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, July 16th, to Saturday, July 21st.—Royal Westminster Ophthalmic Hospital, Broad-street, Holborn, W.C. Special afternoon demonstration in Ophthalmology at 3 P.M. on Thurs., by Mr. Caddy. No fee.—Prince of Wales's Hospital, Tottenham, N. Second week of course in medicine, surgery, and the allied specialties. Daily 10.30 to 5.30 P.M. Further information from the Secretary.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham.

Monday, July 16th.—2.30 to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 P.M., Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

Wednesday.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

Thursday.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, and Ear, Nose and Throat Clinics. Operations.

Friday.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

Appointments.

Don, C. S. D., M.B., Ch.B. Aberd., has been appointed Honorary Assistant Physician, Salford Royal Hospital.

Forrest, A. W., M.D., Ch.B. Edin., D.P.H., Medical Officer of Health and School Medical Officer for Leyton.

Russell, G. J. C., M.B., Ch.B. Manch., D.P.H., Assistant Medical Officer for Maternity and Child Welfare, Leeds Corporation.

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne, Lake Hospital and Darnton House.—2nd. Res. Asst. M.O. £150.

Birmingham, Queen's Hospital.—Med. Reg. Also 3 Res. Surg. Officers. £200 and £100 respectively.

Birmingham University.—Walter Myers Travelling Studentship. £300.

Cambridge, Addenbrooke's Hospital.—Resident Anæs. At the rate of £180.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Jun. H.S. £50. Also Pathologist. £75.

Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C. 2nd. Res. H.S. £75.

Coventry, Coventry and Warwickshire Hospital.—Res. H.P. £125.

Durham County Sanatorium, Hollywood Hall, Wolsingham.—Locum. 9 guineas per week.

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[illegible] Medical College
7390

of motor accident cases, he would consider introducing a Bill rendering insurance compulsory upon all motor drivers and the cost of treatment and maintenance of motor accident cases admitted to voluntary hospitals being made a first charge upon the insurance money.

Sir JOHN MARRIOTT asked the Minister of Transport whether his attention had been drawn to the increasing burden imposed upon voluntary hospitals for the treatment of cases arising from motor accidents; and whether he would introduce legislation to make the insurance of all drivers of motor-cars compulsory and to make the cost of the treatment of motor accident cases a first charge upon the insurance payment.—Colonel W. ASHLEY replied: I have received a copy of the resolution to which the hon. Member refers. The compulsory insurance of all motor vehicles would involve great difficulties, but even if they could be overcome I do not think that it would be practicable to make the cost of treatment and maintenance in voluntary hospitals a first charge on the insurance monies. In order to bring the matter within the scope of a policy of insurance, it would be necessary, in the first place, that the hospital should have an enforceable claim against the patient, and in the second that the patient's injury, if he was a third party, should have been due to negligence on the part of the driver of the vehicle.

Disinfection of Casuals' Clothing.

Mr. SHEPHERD asked the Minister of Health whether, in view of the fact that the method most commonly used for the disinfection of the clothing of casuals rapidly destroyed the material, he would issue regulations to boards of guardians whereby disinfection would not destroy such clothing.—Sir KINGSLEY WOOD replied: My right hon. friend is advised that articles of clothing can be repeatedly disinfected without being damaged, though after a time the process may tend to deteriorate the clothing. He is afraid no regulations which he can issue will alter the position in this regard.

Medical News.

UNIVERSITY OF LIVERPOOL.—At recent examinations the following candidates were successful:—

M.D.

C. B. Bamford, C. A. Birch, J. D. Craig, M. M. Datnow, R. Y. Dawbarn, S. B. Hall, and Nellie Wall-Mesham.

CH.M.

P. R. Hawe and P. Malpas.

M.B. AND CH.B. WITH HONOURS.

Class I.—T. B. Davie,[1,2,3] J. H. Follows,[1,3] and E. W. Jones.[1,2]
Class II.—E. T. Bates,[1] T. L. Dowell,[1] and M. Silverstone.[3]

FINAL EXAMINATION FOR M.B. AND CH.B.

Part III. (Old Regulations).—S. W. Adler, S. Canter, Gladys A. Coventry, Ariel R. S. Deacon, H. R. Dugdale, Ruth M. Fennell, Agnes G. Gillespie, R. G. Gornall, J. J. Graham, G. T. Harris, K. Jilani, Mary G. Jones, W. E. J. Jones, T. Lasker, N. R. Lawrie, H. Leiper, J. R. Mitchell, T. C. Newman, Winifred O'Callaghan, J. Pasvolsky, H. Paterson, H. W. Smith, G. G. Warburton, and A. L. Williams.

[1] Distinction in Medicine. [2] Distinction in Surgery. [3] Distinction in Obstetrics and Gynæcology.

M.B. AND CH.B.

Part A (New Regulations).—A. H. Barzilay, M. J. Bennett-Jones,[7] L. Findlay,[4,5,6,7] A. T. Halton, J. C. Hill, T. N. A. Jeffcoate,[5,7] D. A. Jones, J. Libman,[4,5,6,7] G. A. C. Lynch, J. A. Martinez,[7] H. J. Partington,[4,7] C. L. Pratt, C. K. Sconce, E. B. Whittingham, and J. P. Woodward.[7]
Part I. (Old Regulations).—A. L. Beresford and F. J. H. Crawford.
Part II. (Old Regulations).—J. D. Bright-Richards and Florence M. E. Davies.

[4] Distinction in Special Pathology. [5] Distinction in Forensic Medicine. [6] Distinction in Public Health. [7] Distinction in Pharmacology and General Therapeutics.

D.P.H.

W. T. Donovan, S. C. Gawne, Thirza Redman, Mary H. Wild, and Grace H. Wood.

D.T.M.

J. D. Bilimoria, W. L. Blakemore, K. V. R. Choudari, K. K. Dhar, W. E. Holmes, W. S. Maclay, A. H. Morley, I. Sanderson, and S. Sivalingam.

UNIVERSITY OF MANCHESTER.—At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B. AND CH.B.

G. L. Brown,* Doris Bernard, E. H. Brooks, Mary G. Davies, Ralph Edmundson, Alexandra W. Groves, G. B. Hardman, Simon Kelly, Morris Levine, J. A. Longworth, Stanley Nowell, S. L. Rowley, R. F. Sheppard, Henry Tickle, and J. F. Wilkinson.

* With second-class honours and distinction in obstetrics.

The following have satisfied the examiners in the undermentioned subjects:—

Forensic Medicine.—J. S. Miller.
Medicine.—I. M. Hughes.
Hygiene, &
Obstetrics Alice M. Butterworth,
M. A. C Evelyn I. M. Sheppard,
Raymond Whitehead, and Frederick Wraith.
Forensic Medicine, Hygiene,
Allan, H. S. Bagshaw, I
Edith M. Booth, B. R.
Brown, Bessie H. E. Cac
W. W. Fox, J. N. Greenv
F. N. Marshall, A. B.
O'Loughlin, G. E. Plowright, B. P. Robinson, Donal Sheehan, C. F. Stott, Nellie Wilson, and L. C. Wright.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

Richard Handley, J. E. Howie, W. H. Shepley, and Harry Stafford.
Part I.—Nicolas Gebbie.

DIPLOMA IN BACTERIOLOGY.

A. W. Laing.

DIPLOMA IN PUBLIC HEALTH.

Part I.—Andrew Anderson, Frank Appleton, Helen G. M. Bennett, Arnold Brown, J. J. O'Reilly, Jean M. Orkney, Mary I. Prentice, Kathleen Sheehan, and P. H. J. Turton.

FINAL EXAMINATION FOR B.D.S.

S. R. Medd and F. W. Williams.

FINAL EXAMINATION FOR DIPLOMA IN DENTISTRY.

Mary M. Brandwood, Bernard Cooke, D. L. Parkes, J. N. Peacock, L. D. Smith, W. G. Taylor, and G. B. Warburton.

UNIVERSITY OF ABERDEEN.—At a graduation ceremony held on July 3rd the following degrees were conferred:—

Hon. LL.D.—John Alexander MacWilliam, F.R.S., Emeritus Professor of Physiology in the University.
M.D.—Wilfrid Marshall,* Mathilda F. Menzies,† C. S. D. Don,‡ I. G. Innes,‡ Edward James,‡ Beatrix B. Law,‡ Roderick Mackay,‡ Katherine C. Spence‡, Walter Graham, Robina Inkster, Alexander Johnstone, Moore Taylor, and W. L. Yell.

*Awarded highest honours for thesis. †Awarded honours for thesis. ‡Awarded commendation for thesis.

M.B. and Ch.B.—B. S. Cran * and J. A. Gordon * (with second-class honours); Henry Aitken, R. D. Bruce, D. D. Callaghan, S. E. N. Chinniah, Andrew Dickson, William Fettes, J. S. Firth, H. M. Gray, Norman Jolly, J. S. Lawrie, A. W. R. MacKenzie,* R. J. Mackenzie, M. M. Milne, J. L. Nicol, J. M. Paterson, C. S. Philip, Margaret F. Reid, J. S. Robertson, W. M. Smith, Andrew Stephen, C. H. Strachan, Alfred Wilkie,* G. A. Wilson, and J. A. D. Wyness.

* Completed Final Medical Professional Examination with distinction.

B.Sc.—Wilfrid Marshall, M.D.
D.P.H.—J. L. Gammie (with credit), J. R. W. Hay, and A. J. W. Wilkins.

UNIVERSITY OF DUBLIN.—At a meeting of the Senate on June 30th the degree of M.D. was conferred on C. R. Boland, W. S. Dickson, and H. J. Hugo. At recent examinations the following candidates have been successful:—

FINAL EXAMINATION FOR M.B., B.CH. AND B.A.O.

Part I., Therapeutics, Pathology, &c.—*Eva E. Moore, F. O. Pilkington, J. T. Robinson, R. T. O'Shea, Dora G. Bradley, E. S. Tweedy, Frances E. Wilson, R. E. Hemphill, W. A. Robinson, Kathleen A. Wilson, and N. S. Klass.
Part II., Medicine.—C. P. Martin, E. K. Malone, Julius Sayers, D. M. Brink, I. F. Ratthaus, R. H. Bland, Julius Horwich, Nathaniel Burstein, R. I. G. Reid, and J. M. M'Elligott.
Surgery.—W. J. E. Jessop, C. P. Martin, G. W. F. Pratt, I. W. Pigott, H. S. Smithwick, R. F. W. K. Allen, R. H. Bland, E. S. Adderley, Nora A. Stack, D. S. P. Wilson, F. O. W. A. Mahon-Daly, H. R. F. Tweedy, D. M. Brink, E. C. Hicks, Mollie Finegan, A. J. Burden, H. J. Robinson, Marie M. E. Lea-Wilson, and L. R. H. Keatinge.
Midwifery.—*G. C. Dockeray, A. G. Thompson, M. H. Fridjhon, M. E. Kirwan, L. L. Griffiths, W. R. Johnston, Josephine M. Enright, Anna M. E. M'Cabe, J. E. C. Cherry, N. H. Lindsay, and W. A. Y. Knight.

DIPLOMA IN PUBLIC HEALTH.

Part I.—C. R. Nunan, R. A. Q. O'Meara, *Sarah Walsh, Michael Casey, W. A. Dickson, and Mary E. Ryan.
Part II.—C. R. Nunan, P. H. Lemass, Kathleen M. Ball, and Alice E. S. Delany.

DIPLOMA IN GYNÆCOLOGY AND OBSTETRICS.

Eva Ho Tung.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

Parts I. and II.—K. K. Drury.

* Passed on high marks.

CONGRESS OF SURGERY IN FRANCE.—The thirty-seventh French Surgical Congress will meet at Paris from Oct. 8th to 13th. Subjects on the agenda are the present status of spinal anæsthesia, the remote results of surgical treatment of duodenal ulcer, and the remote results of cranial trepanning for injuries.

Royal College of Surgeons of England.—The annual election of Fellows into the Council was held on July 5th. There were 12 candidates for four vacancies, and the following were elected: Prof. R. E. Kelly (Liverpool), 446 votes; Mr. F. J. Steward (London), 409 votes; Mr. R. G. Hogarth (Nottingham), 407 votes; and Prof. L. P. Gamgee (Birmingham), 399 votes. The number of voting papers received was 1169.

University of London: *University College.*—Dr. John Kirk has been appointed demonstrator in the department of anatomy and embryology.

University of Birmingham.—At a Congregation held on June 30th the degree of M.D. was conferred on I. de B. Daly, J. F. Brailsford, and F. W. M. Lamb. The degrees of M.B. and Ch.B., and B.D.S. were conferred on the candidates whose names were given on p. 44 of our last issue as having passed the requisite examinations.—The Queen's scholarships for the third, fourth, and final year were awarded to K. S. Williams, W. C. Smallwood, and G. H. Knight respectively; the Ingleby scholarships to F. R. Roberts and A. B. Taylor, the Arthur Foxwell Memorial medal to A. B. Taylor, the Peter Thompson prize in anatomy to James Hardman, and the Samson Gamgee Memorial medal for surgery to G. H. Knight.

Dr. Frank Gower Gardner, of Oxford, Captain R.A.M.C. (T.) (ret.), has been elected County Director of the British Red Cross Society for Oxfordshire in place of Colonel Stanier Waller, resigned.

College of Nursing.—The College's petition for a Royal Charter, placed before the Privy Council by Sir Cooper Perry, has been successful.

It is announced that Dr. F. d'Herelle, who has recently been working in India on the treatment of cholera by bacteriophage, has been appointed professor of bacteriology at the Yale School of Medicine, Connecticut, U.S.A.

British Institute of Philosophical Studies.—The annual general meeting of this institute will be held at the Royal Society of Arts, 18, John-street, Adelphi, London, W.C., on Monday, July 16th, at 5.30 P.M. The Earl of Balfour will preside and deliver a short address. Other addresses will be given by Sir Robert Horne, Sir Martin Conway, and the chairman of the institute, Prof. L. T. Hobhouse.

International Congress of Physiology.—The thirteenth International Physiological Congress will meet at the Medical School of Harvard University, Boston, Massachusetts, from August 19th to 23rd, 1929. The Federation of American Societies for Experimental Biology will serve as hosts to the Congress, and Prof. William H. Howell, of Johns Hopkins University, will be the president. The arrangements for the Congress are in charge of Prof. Walter B. Cannon, of the Harvard Medical School, who is chairman of the Congress Bureau, and Prof. Edwin J. Cohn and Alfred C. Redfield, who are the secretaries.

Post-Graduate Courses in Paris.—Holiday courses will be held at the Clinique Médical de l'Hôtel-Dieu from Sept. 10th to 22nd, and from Oct. 1st to 13th, under the direction of Prof. P. Carnot and Prof. M. Villaret. The subjects will be, respectively, Recent Views of Diabetes and Hepatic Diseases, and Recent Views of Digestive Disorders. The interval will be spent in a visit to Vichy. A course on pædiatrics will be held at the Clinique Médicale des Enfants, 149 rue de Sèvres, from July 26th to August 11th, under the direction of Prof. Nobécourt. Those wishing to attend any of these courses should communicate with the Secretary of the Faculty of Medicine (Guichet No. 4) of the University of Paris.

First International Congress of Oto-Laryngology.—This Congress takes place at Copenhagen on July 30th and 31st and August 1st, 1928, and intending visitors should send in their subscription without delay. This has been fixed at 30 Danish kroner per head, with the addition of 15 Danish kroner for every lady in the party, and payment can be made with an English cheque if this be dispatched at once to the hon. treasurer, Dr. Jorgen Moller, Vestre Boulevard 13, Copenhagen. On receipt of the subscription a programme will be dispatched from Denmark giving a list of the festivities and excursions in connexion with the Congress and a form on which should be entered an application for the tickets desired. The application form should be returned without delay to the Secretary-General, Dr. N. Rh. Blegvad, Nytorv 3, Copenhagen. Those who have not already secured hotel accommodation should apply at once to Bennett's Tourist Office, 45, Raadhuspladsen, Copenhagen V., while particulars and tickets for the journey can be obtained from Messrs. Bennett, 66, Haymarket, S.W. 1, and Messrs. Thos. Cook and Son, Berkeley-street, W. 1.

Prof. Share Jones, Professor of Veterinary Science at the University of Liverpool, has been appointed President of the Royal College of Veterinary Science.

Sanatorium's Change of Name.—Highfield Sanatorium, in Edge Lane Drive, Liverpool, will in future be known as Broadgreen Sanatorium.

Osteolysis in the Mouth.—We are informed that a series of photomicrographs by Dr. Arthur Hopewell-Smith, illustrative of the process of osteolysis as it occurs in the oral cavity, has been added to the annual exhibition of the Museum of the Royal College of Surgeons, Lincoln's Inn-fields, London, W.C. The exhibition will remain open until July 28th.

Extension of Jenny Lind Hospital.—Mrs. Raymond Maude, daughter of the foundress, has laid the foundation-stone of a new out-patient and special department block of this Norwich hospital for children. The extension, which is being partially paid for by a grant from the Norwich Joint Hospitals and War Memorial Fund, includes accommodation for the electrical, X ray, and massage departments. Mrs. Maude also opened Pym House, a nurses' hostel, formed by throwing two houses into one, which has been provided from a bequest by the late Mrs. Radford Pym.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, July 16th, to Saturday, July 21st.—Royal Westminster Ophthalmic Hospital, Broad-street, Holborn, W.C. Special afternoon demonstration in Ophthalmology at 3 P.M. on Thurs., by Mr. Caddy. No fee.—Prince of Wales's Hospital, Tottenham, N. Second week of course in medicine, surgery, and the allied specialties. Daily 10.30 to 5.30 P.M. Further information from the Secretary.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, *Prince of Wales's General Hospital, Tottenham.*

Monday, July 16th.—2.30 to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 P.M., Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

Wednesday.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

Thursday.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, and Ear, Nose and Throat Clinics. Operations.

Friday.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

Appointments.

Don, C. S. D., M.B., Ch.B. Aberd., has been appointed Honorary Assistant Physician, Salford Royal Hospital.

Forrest, A. W., M.D., Ch.B. Edin., D.P.H., Medical Officer of Health and School Medical Officer for Leyton.

Russell, G. J. C., M.B., Ch.B. Manch., D.P.H., Assistant Medical Officer for Maternity and Child Welfare, Leeds Corporation.

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne, Lake Hospital and Darnton House.—2nd. Res. Asst. M.O. £150.

Birmingham, Queen's Hospital.—Med. Reg. Also 3 Res. Surg. Officers. £200 and £100 respectively.

Birmingham University.—Walter Myers Travelling Studentship. £300.

Cambridge, Addenbrooke's Hospital.—Resident Anæs. At the rate of £180.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Jun. H.S. £50. Also Pathologist. £75.

Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C. 2nd. Res. H.S. £75.

Coventry, Coventry and Warwickshire Hospital.—Res. H.P. £125.

Durham County Sanatorium, Hollywood Hall, Wolsingham.—Locum. 10 guineas per week.

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East London Hospital for Children, &c., Shadwell, E.—Res. M.O. £200.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.

Exeter, Royal Devon and Exeter Hospital.—Hon. Asst. P.

Exminster, Devon Mental Hospital.—Jun. Asst. M.O. £300.

Great Yarmouth General Hospital.—H.S. £150.

Harefield, Middx., County Tuberculosis Sanatorium.—Sen. Asst. Res. M.O. £450.

Leeds City Hospitals.—Med. Supt. £850.

Leeds Public Dispensary.—Sen. Res. M.O. £200. Also Hon. P.

Liverpool, Royal Children's Hospital.—Res. M.O. At rate of £120. Also two Res. H.P.'s and two Res. H.S.'s. Each at rate of £60.

London Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150.

London School of Hygiene and Tropical Medicine, 25, Gordon-street, W.C.—Research Student in Tropical Pathology. £250.

Marseilles, Queen Alexandra Memorial Hospital.—Res. M.O. At rate of £150.

Middlesex Hospital and Medical School.—Surgical Registrarship. At rate of £300.

Newark Hospital and Dispensary.—Res. H.S. At rate of £150.

Norwich, Norfolk and Norwich Hospital.—H.S. £120.

Nottingham, City Mental Hospital.—Jun. Asst. M.O. £350.

Nottingham General Hospital.—Res. Cas. O. At rate of £200.

Nottinghamshire County Council and Mansfield Woodhouse Urban District Council.—Joint M.O. £700.

Portsmouth, Royal Portsmouth Hospital.—Sen. H.S., also Cas. O. At rate of £200 and £100 respectively.

Preston and County of Lancaster Royal Infirmary.—H.P. and H.S. £190 and £150 respectively.

Rochdale Infirmary and Dispensary.—Jun. H.S. £200.

Royal Army Medical Corps.—Commissions.

St. John's Hospital, Lewisham, S.E.—Res. H.O. Also Res. Cas. O. Each at rate of £100.

St. Luke's Hospital, Chelsea, S.W.—Consulting Physician. 100 guineas.

Society of Apothecaries of London.—Examiner in Midwifery.

Staffordshire, Lechfield County Laboratory.—Bacteriologist. 10 gns per week.

Taunton, Taunton and Somerset Hospital.—Sen. and Jun. House M.O.'s. At rate of £150 and £100 respectively.

West London Hospital, Hammersmith-road, W.—Res. Asst. Surg. £200.

Woolwich and District War Memorial Hospital, Shooters' Hill, S.E.—Sen. H.S., also H.P. Each at £125.

Worcester County and City Mental Hospital, Powick, near Worcester.—Jun. Asst. M.O. £300.

The Chief Inspector of Factories announces the following vacancies for Certifying Factory Surgeons: Falkland (Fifeshire), Bourton (Dorsetshire), Rothwell (Northamptonshire), Llanfairfechan (Carnarvonshire), Wirksworth (Derbyshire), and Crook (Co. Durham).

Notice is given of a vacancy for a Medical Referee under the Workmen's Compensation Act for Edinburgh City and Linlithgow County (Sheriffdom of the Lothians and Peebles). Applications should reach the Private Secretary, Scottish Office, Whitehall, London, S.W., not later than July 28th.

Births, Marriages, and Deaths.

BIRTHS.

BATEY.—On July 4th, at Beaufort House, Ealing, W., the wife of Maurice Batey, L.D.S. R.C.S. Eng., of a son.

DIX.—On July 6th, 1928, at 11, Alexandra Park-road, N. 10, to Nan, the wife of Victor Dix, F.R.C.S.—a daughter.

HERN.—On July 2nd, at Lexham-gardens, W., the wife of Dr. J. R. B. Hern, of a daughter.

KINGDON.—On July 4th, the wife of A. T. L. Kingdon, M.R.C.S., L.R.C.P., of South-street, Leominster, of a daughter.

DEATHS.

BOWKER.—On July 6th, at North Parade, Bath, George Edward Bowker, M.D. Edin.

PARSONS.—On July 2nd, at Bournemouth, John Inglis Parsons, M.D., M.R.C.P., M.R.C.S., aged 71.

PRITCHARD.—On July 6th, W. Clowes Pritchard, M.R.C.S., L.R.C.P., of Hastings.

STONEY.—On July 5th, at Abbeyleix, Ireland, Hugh Baker Stoney, M.B.

WIGGINS.—On July 3rd, suddenly, Charles Wiggins, M.R.C.S., L.R.C.P., of Argyll, Fortis Green, East Finchley.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET,"

VOL. I., 1928.

THE Index and Title-page to Vol. I., 1928, which was completed with the issue of June 30th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Notes, Comments, and Abstracts.

HOSPITAL LAW.

LIABILITY OF HOSPITALS AND THEIR PROFESSIONAL STAFFS.

BY CAPTAIN J. E. STONE, M.C., F.S.A.A.,

HON. SECRETARY, INCORPORATED ASSOCIATION OF HOSPITAL OFFICERS.

II.*—LIABILITY OF SUBORDINATES.

PHYSICIANS and surgeons of a hospital are not necessarily liable for injury caused by the carelessness of their subordinates in carrying out the treatment ordered by them, unless it can be shown that the matter was one which ought not to have been left to a subordinate, or that they had *themselves neglected some precautions* which ought to have been taken, or had superintended or been present at the carrying out of the treatment. Thus, where a patient was severely scalded by reason of the negligence of a nurse in administering a hot bath ordered by the surgeon, it was held that the surgeon was not liable. It was proved to be the usual hospital practice to leave it to the nurses to see to the baths. *The decision, however, does not deal with* the question whether or not the hospital itself was liable for the negligence of the nurse.

A sister or nurse may equally be liable for negligence in carrying *out the duties entrusted* to her. In the case above mentioned, the action which failed against the surgeon would probably have succeeded against the nurse. Members of the nursing staff may also incur liability if they exceed the duties assigned to them; their functions are subordinate to those of the physician and surgeon, and any attempt by nurses to usurp the place of a qualified *medical officer might place them in peril.*

Where the injury to a patient is the immediate result of intervening negligence on the part of the patient himself, or where the patient by his own carelessness directly contributes to it, the patient's contributory negligence is a good defence to an action. Where, however, damages are obtainable, and the patient dies, they may be recovered for the *benefit of his or her wife, husband, parent,* or child.

Criminal Negligence.

There is a distinction between the negligence which gives right to damages in a civil action and the negligence sufficient to support a conviction in a criminal case. The distinction, however, is not clear, and it is perhaps rather a question of degree. Gross negligence is of two kinds, as for example: (1) when a physician deliberately neglects his patients; and (2) when a person without skill in his profession *ignorantly* and rashly uses dangerous medicine. Criminal liability is incurred by a competent person for death occasioned by gross want of care; as, for example, by insufficient attention to a woman after her confinement. Malpractice, which generally means an unprofessional treatment of disease, pregnancy, or body injury, either from gross carelessness or ignorance, or with *criminal* intent, would *certainly extend* to the performance of operations for mere curiosity or experiment, which is a criminal offence. *Mala praxis* is a great misdemeanour and offence *at common* law (whether *it be for curiosity* or experiment, or by neglect), because it breaks the trust which the party has placed in the physician. Doctors and nurses may *therefore* incur personal liability: (*a*) to an action for damages for incompetence and negligence; (*b*) to criminal proceedings for malpractice and criminal negligence.

Relationship of Professional Staff to Hospital.

As liability for criminal acts cannot extend beyond the persons themselves, it is only in respect of *their* liability to a *civil action that* the question of the consequent liability of the hospital whom they represent need be considered. It is clear that the foundation of any such liability *must* rest upon *the law of agency*. The general doctrine of law is that although the principal is not ordinarily liable (for he sometimes is) in a criminal suit for the acts or misdeeds of his agent, unless indeed he has authorised or coöperated in those acts, &c., yet he is held liable to third persons in a civil suit for the frauds, deceits [illegible]representations, negligences, and *other* [illegible]nces and omissions of duty of his agent in the course of his employment, although the principal did not authorise, justify, participate in, nor indeed, know of *such misconduct*, or *even if he forbade the acts* or disapproved of them. In all such cases the rule applies *respondeat superior*, and it is founded upon public policy and convenience, for in no other way could there be any safety to third persons in their dealings, either directly with the principal or indirectly with him through the instrumentality of agents. In every such case the principal holds out his agent as competent and fit to be trusted, and thereby in effect he warrants his fidelity and good conduct in all matters coming within the scope of his agency.

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* The previous article of this series appeared in THE LANCET of April 28th, p. 895.

Who are servants of a hospital?—The principle is well established that a master is liable for the negligence of his servant who is acting in the course of his employment. This principle of liability applies to hospitals in the same way that it applies to individuals. The term "servant" has in law a much more restricted meaning than that which is popularly attributed to it. A servant has been defined as—"Any person employed by another to do work for him on the terms that he, the servant, is to be *subject to the control and direction of his employer* in respect of the *manner* in which his work is to be done." A servant as thus defined must be distinguished from an independent contractor. The test is the existence of a right of *control* over the agent in respect of the *manner* in which his work is to be done. A servant is an agent who works under the supervision and direction of his employer; he is employed to obey his employer's orders from time to time. An independent contractor is one who is his own master; he is engaged to do certain work, but he exercises his own discretion as to the mode and time of doing it. A hospital board will accordingly be responsible for the negligent acts or omissions of a servant in the course of his employment. The servant must be in the employ of the board at the time the acts complained of are done.

Who of those persons appointed by hospitals are servants of the hospital? This question must be answered in respect of every individual or class of officers. The persons engaged in a hospital may for convenience be classified as follows: (1) Physician and surgeons (including house officers, anæsthetists, and specialists); (2) nursing staff; and (3) lay or non-professional staff.

With regard to the first named class it has been expressly decided (Hillyer v. Governors of St. Bartholomew's Hospital) that the relationship of master and servant does not exist between the governors of a hospital and the physicians and surgeons who give their services to the hospital. It was held that they are professional men, employed by a hospital to exercise their profession to the best of their abilities according to their own discretion: but in exercising it they are in no way under the orders nor bound to obey the directions of the hospital authorities. It is true that a hospital has power to dismiss these officers, but it has this power, not because they are servants, but because of its control over the hospital where their services are rendered. A staff surgeon or physician then is not an employee of the hospital but holds an independent professional relation; he, not the hospital, is liable for his acts, and by reverse reasoning the hospital would not be liable for injuries which he might suffer in the course of his work in the hospital. A medical superintendent is, however, more directly associated with the board. He is, in general, appointed by the board at a fixed salary under a special contract with the board, and usually has control over all departments of the hospital, and the treatment of the patients therein. It may be contended, however, that as far as the treatment of patients is concerned, he is not a servant of the board because he is not subject to the control of the board as to the mode of treatment he adopts. The degree of control which a board may exercise over a medical superintendent undoubtedly varies in different cases, but it is most unlikely that in every case a board would have the power of dictating in what way he should conduct operations or treat patients. This is entirely a matter for the superintendent in the exercise of his professional skill and knowledge. House officers are employees of the hospital when acting under the direction of the hospital authority, but they also hold a quasi-professional relationship, and in addition they have a special relation to the physician or surgeon whom they may be asissting. In Cooper v. Mirron and Another, a house officer was held liable for so extracting a tooth that a part broke off and passed down the windpipe. The accident was not reported to his senior; pneumonia set in, and the patient died.

With regard to the second class, the position of the nursing staff of a hospital is, however, not so clearly defined. They are engaged by the board at fixed salaries, their hours of attendance in the wards and general duties are prescribed by the board by whom they are paid and by whom they may be dismissed. These features point to the fact that they are servants of the board: for all general purposes this is undoubtedly the correct view, but they are not so for the purposes of operations and examinations by medical officers. Nurses (and indeed other officials) assisting at operations cease for the time being to be servants of the hospital inasmuch as they take their orders from the operating surgeons alone and not from the hospital authorities. Can they be deemed the servants of the board when attending patients in the wards and acting in their professional capacity? All nurses require a special training to fit them for their occupation, and it may be argued that they are not subject to the control of the board in the manner in which they do their work. In their treatment of, and attendance on, patients, they act either under the direction of physicians or in accordance with their professional skill and knowledge. The board is not, it is contended, in a position to dictate in what way the work is to be done. Although it fixes the hours, supplies necessary board and lodging, pays and dismisses nurses, it cannot control them in the exercise of their profession as nurses. From this point of view they are not the servants of the board in the course of any of their professional duties. The dicta of Kennedy L.J., in Hillyer v. St. Bartholomew's Hospital support this view. He classes nurses as experts along with physicians and surgeons, and states that, provided the board has been reasonably satisfied as to their competency, it will not be liable for their negligence. This of course refers only to the conduct of the staff in matters of *professional skill*, in which the board *neither do nor could not properly interfere* either by rule or supervision. The board would, it is contended, be legally responsible to the patients for the due performance of their servants within the hospital of their purely *ministerial or administrative duties*, such as for example, attendances of nurses in the wards, the summoning of medical aid in cases of emergency, the supply and service of food, and the like. The board ought to make, and invariably does make, its own regulations in respect of such matters of routine, and it is obviously legally responsible for their sufficiency, their propriety, and observance of them by their servants. The scope of these ministerial duties or matters of routine is difficult to define. It will generally be found that most of the duties of the nurse are professional, and required special skill or knowledge. In matters, however, which do not require special skill nor knowledge, nurses must be regarded as the servants of the board, and in such matters the board may properly interfere. These matters will be few in number, and a nurse will, therefore, in general not be the servant of the board.

All other officials and employees about the hospital are with certain exceptions, servants of the board. Exceptions occur when they are working under the exclusive control of physicians and surgeons and other medical and nursing experts.

The Duty and Obligations of the Board.

Although the board is not responsible for the negligence of its professional staff in the exercise of their profession, it is under the duty to see that the professional staff employed by it are competent. It undertakes that the patients in and attending the hospital will have competent advice and assistance. (Evans v. Liverpool Corporation). The governors of a hospital, by their admission of the patient to enjoy in the hospital the gratuitous benefit of its care, tacitly undertake that the patient whilst there shall be treated by experts, whether surgeons, physicians, or nurses, of whose professional competence the governors have taken reasonable care to assure themselves; and further, that these experts shall have at their disposal for the care and treatment of the patient fit, adequate, and proper apparatus and appliances. There is no right legal inference from the circumstances of the relation of hospital and patient that the hospital authority makes itself liable in damages if members of its professional staff, of whose competence there is no question, act negligently towards the patient in some matter of professional care or skill, or neglect to use intelligently in their treatment the apparatus or appliances which are at their disposal. If, then, a hospital board exercise reasonable care in the selection of its professional staff by requiring satisfactory evidence of their competency, it will not be liable subsequently for the negligence of its staff. If, of course, for any reasons it has good ground to doubt the competency of any member of its staff under circumstances which would justify it in dismissing such member, it should do so.

Paying Patients.

In Foote v. Shaw Stewart, an attempt was made to distinguish the circumstances from the St. Bartholomew's case, in respect that the Greenock Hospital authorities, by receiving a fee of £2 2s. from the patient, undertook that the treatment which she should *receive* from the doctors would be reasonably skilful and careful. Otherwise stated, this argument implied that *though* to the ordinary charity or non-paying patient the duty of the hospital was simply to provide the services of a competent staff of medical men, yet to a paying patient they were bound to ensure a special degree of medical care and attention, or a guarantee of skill on the part of the surgeon. The court held that, in the absence of a contract much more specific and *definite* than could be implied from the plaintiff's arguments, they could make no distinction between the two cases.

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SIR,—The result of our yearly appeal in the press has been of such value in the past that we trust you will once more allow us space in which to plead the cause of this Fund. Just now many fortunate people are engaged in the all-important task of making plans for their summer holiday—a delightful and necessary change of scene. We would ask them not to forget the many hundreds of women in London who have little chance of getting away from the monotony of their daily life, who in many cases have never tasted the joy of a seaside or country holiday, and whose health is suffering in consequence. This Fund, which was founded in 1895, organises every summer a fortnight's holiday at the seaside for many of these tired women who contribute what they can towards the full cost (£3 for a fortnight including railway fare). Last year 864 women were sent away and 500 of these took their babies. Will all holiday-makers help us to increase the number this year by sending some contribution, however small, to the Secretary, Women's Holiday Fund, Denison House, Vauxhall Bridge-road, S.W. 1.

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"Swimeezi" Bathing Costume.—We are informed that the address of the Institute of Patentees referred to in our notice of the above invention is now at 39, Victoria-street, Westminster, S.W. 1.

Dedication Address

ON

MEDICAL AND NURSING SERVICE.

Delivered on June 26th at the Inauguration of the Hospital and Nursing Centre established by the Frontier-Nursing Service of Kentucky

BY SIR LESLIE MACKENZIE, M.A., M.D., LL.D.,
FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS, EDINBURGH; FELLOW OF THE ROYAL SOCIETY OF EDINBURGH; EX-MEMBER OF THE SCOTTISH BOARD OF HEALTH; CROWN NOMINEE FOR SCOTLAND ON THE GENERAL MEDICAL COUNCIL OF GREAT BRITAIN.

THE Frontier Nursing Service already know the work of the pioneers in preparing the way for this assembly of inauguration and dedication. It is a story full of adventure, sacrifice, passionate enthusiasm and splendid initiative. When, some years ago, Mrs. Mary Breckinridge came to us in Scotland to see how we had faced a similar problem in medical service and nursing, we were filled with a new sense of the significance of the work we had tried to do in the thinly peopled and difficult areas of Scotland. When, therefore, I was invited by the Frontier Nursing Service of Kentucky to give verbal form to the dedication of the hospital and nursing system now established in these mountains, I felt, indeed, a glow of supreme satisfaction that our work in Scotland had found an echo in the great spaces and mountains of an American Commonwealth. The invitation was a call of the Highlands to the Highlands. It is a symbol of kinship in feeling and outlook. It is the lightning spark that reveals the essential unity of our culture. An invitation coming with this warmth and delicacy of imagination, I could not refuse and, in the name of the Scottish Highlands, I accepted it with my whole heart. When my wife and I, more than 35 years ago, dedicated our lives to the service of Scotland, we could not foresee that now, when our work is nearing its end, we should be gladdened and newly inspired by this fine compliment to our Northern Kingdom. But the privilege and honour you have conferred upon us will make it easier for us to pass into the twilight of our lives, remembering the lights and sounds and silences of these historic creeks and mountain passes and pathways.

Perhaps, however, my presence here is due to a deeper cause. I was born in Easter Ross, within sound of the North Sea and within sight of the mountains of Ross and Inverness. From my earliest memories, I have known something of the difficulties of Highland life, and when I passed into the National Service I came to the health problems of the Highlands and Islands with some understanding of the inner minds and aspirations of the people, of the difficulties due to a long and losing struggle with poverty and of the problems created by centuries of European invasion, whose story is lost in legend and mystery. The more one studies things as they are to-day, the more one is impressed with the infinite complexities of the growth of peoples. At this hour, the ten million acres of the Highlands and Islands of Scotland have scattered over them a population less than the city of Edinburgh. In our Highland area, as defined by statute in the Highlands and Islands Medical Service Act, the peoples number approximately 320,000 only. But these are scattered in islands as far north as the Shetland group, about 120 miles from the mainland of Scotland; *the Orkney* group, mostly visible from the mainland; the Fair Isle, a solitary island of some 200 people lying between the two groups; the remote island rock of Foula with perhaps another 200; the Out Skerries with 30 or 40 families, and then the Outer Hebrides, from Lewis to Barra, with a total population of 44,000, or the remote Atlantic rock of St. Kilda, where the population within my official life-time of 27 years has fallen from 76 to 45. No doubt, it is these varieties of difficult administration that have fascinated Mrs. Breckinridge in looking for a parallel with the difficulties of the Kentucky mountains, and there are many parallel conditions in the two countries. But most striking, perhaps, is the parallel in character and outlook, the disposition due to the necessity of facing the forces of nature alone, the relative sterility of the hills and glens, as well as the ferocities of the wind and the sea.

AN ADMINISTRATIVE DIFFICULTY.

From the map it is easy to see why the Highlands and Islands are an administrative difficulty. When a population approximately equal to the city population of Edinburgh is scattered over three-fourths of Scotland and parcelled out among the hills, the valleys and islands, the mere geographical dispersal gives rise to innumerable and persistent local problems of feeding, housing, and transport. This would be true even if the dispersed people all belonged to a single variety of civilisation. But in the Highlands and Islands are to be found strata of many civilisations. There are differences in belief, in custom, in variety of segregation, in economic sufficiency, in race, in political affinity. In every Government department—poor law, lunacy, public health, agriculture, fisheries, prisons—all these factors have to be reckoned with, and unending records show how difficult the individual problems are. Among the western islands—the Hebrides—there is scarcely one that has not its little internal war between the local middle-man and the island producer, or between the crofter and the big estate, or again, between the land interest and the industrialised fishing islands or towns, or between sections of the same island, where, perhaps, racial traditions block the way to complete assimilation, or again, between different religious groups, each claiming divine rightness for its own doctrines. Such mental segregations and specialisations often block the way to successful administration. These, and such as these, are the motive forces that have generated the complex machinery of our existing administration. The variations in the machine are reflected in the long series of commissions and committees that have had to investigate every phase of social life in the Highlands and Islands. The reports are only a record of efforts to compose the struggles of these variously civilised groups to maintain themselves, first against nature and next against their domestic enemies. Only a generation or two ago, it was " war to the knife " in the literal sense. To-day the struggles are as keen, but the methods of fighting are more subtle. But the kind of fact we constantly run up against is this: that conscription made almost no difference to the island of Lewis, with its 28,000 inhabitants, because nearly all the men of fighting age had already joined some fighting unit of land or sea; or, again, that one of the island groups most affected with tuberculosis sent relatively high proportions of men to the Navy; or that, in one parish of some seven thousand people, there are said to be 22 " places of worship," representing at least four, if not five or six, Protestant denominations; or, once more, that the Highlands and Islands send to the Universities of Scotland from 10 to 12 times as many persons in proportion to population as the rest of Scotland. The last fact I learned many years ago from my last schoolmaster, Dr. Dey, late Rector of the Grammar School of Old Aberdeen, who had the arranging of secondary departments for the Highlands Committee. A tutor of Oriel College, Oxford, once told me that the best philosophical student he had had in 30 years came from Stornoway. Recently, a book on the nature of " community " came on the philosophical world from "a young Canadian professor," who went to Canada, via Oxford, from Lewis, and is now a professor in Columbia University. How easy it would be to load pages with such facts, or with flashes of beauty from the lochs or voes, or romantic tales of old adventure, or

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BY SIR LESLIE MACKENZIE, M.A., M.D., LL.D.,

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS, EDINBURGH; FELLOW OF THE ROYAL SOCIETY OF EDINBURGH; EX-MEMBER OF THE SCOTTISH BOARD OF HEALTH; CROWN NOMINEE FOR SCOTLAND ON THE GENERAL MEDICAL COUNCIL OF GREAT BRITAIN.

THE Frontier Nursing Service already know the work of the pioneers in preparing the way for this assembly of inauguration and dedication. It is a story full of adventure, sacrifice, passionate enthusiasm and splendid initiative. When, some years ago, Mrs. Mary Breckinridge came to us in Scotland to see how we had faced a similar problem in medical service and nursing, we were filled with a new sense of the significance of the work we had tried to do in the thinly peopled and difficult areas of Scotland. When, therefore, I was invited by the Frontier Nursing Service of Kentucky to give verbal form to the dedication of the hospital and nursing system now established in these mountains, I felt, indeed, a glow of supreme satisfaction that our work in Scotland had found an echo in the great spaces and mountains of an American Commonwealth. The invitation was a call of the Highlands to the Highlands. It is a symbol of kinship in feeling and outlook. It is the lightning spark that reveals the essential unity of our culture. An invitation coming with this warmth and delicacy of imagination, I could not refuse and, in the name of the Scottish Highlands, I accepted it with my whole heart. When my wife and I, more than 35 years ago, dedicated our lives to the service of Scotland, we could not foresee that now, when our work is nearing its end, we should be gladdened and newly inspired by this fine compliment to our Northern Kingdom. But the privilege and honour you have conferred upon us will make it easier for us to pass into the twilight of our lives, remembering the lights and sounds and silences of these historic creeks and mountain passes and pathways.

Perhaps, however, my presence here is due to a deeper cause. I was born in Easter Ross, within sound of the North Sea and within sight of the mountains of Ross and Inverness. From my earliest memories, I have known something of the difficulties of Highland life, and when I passed into the National Service I came to the health problems of the Highlands and Islands with some understanding of the inner minds and aspirations of the people, of the difficulties due to a long and losing struggle with poverty and of the problems created by centuries of European invasion, whose story is lost in legend and mystery. The more one studies things as they are to-day, the more one is impressed with the infinite complexities of the growth of peoples. At this hour, the ten million acres of the Highlands and Islands of Scotland have scattered over them a population less than the city of Edinburgh. In our Highland area, as defined by statute in the Highlands and Islands Medical Service Act, the peoples number approximately 320.000 only. But these are scattered in islands as far north as the Shetland group, about 120 miles from the mainland of Scotland; the Orkney group, mostly visible from the mainland: the Fair Isle, a solitary island of some 200 people lying between the two groups; the remote island rock of Foula with perhaps another 200; the Out Skerries with 30 or 40 families, and then the Outer Hebrides, from Lewis to Barra, with a total population of 44,000, or the remote Atlantic rock of St. Kilda, where the population within my official life-time of 27 years has fallen from 76 to 45. No doubt, it is these varieties of difficult administration that have fascinated Mrs. Breckinridge in looking for a parallel with the difficulties of the Kentucky mountains, and there are many parallel conditions in the two countries. But most striking, perhaps, is the parallel in character and outlook, the disposition due to the necessity of facing the forces of nature alone, the relative sterility of the hills and glens, as well as the ferocities of the wind and the sea.

AN ADMINISTRATIVE DIFFICULTY.

From the map it is easy to see why the Highlands and Islands are an administrative difficulty. When a population approximately equal to the city population of Edinburgh is scattered over three-fourths of Scotland and parcelled out among the hills, the valleys and islands, the mere geographical dispersal gives rise to innumerable and persistent local problems of feeding, housing, and transport. This would be true even if the dispersed people all belonged to a single variety of civilisation. But in the Highlands and Islands are to be found strata of many civilisations. There are differences in belief, in custom, in variety of segregation, in economic sufficiency, in race, in political affinity. In every Government department—poor law, lunacy, public health, agriculture, fisheries, prisons—all these factors have to be reckoned with, and unending records show how difficult the individual problems are. Among the western islands—the Hebrides—there is scarcely one that has not its little internal war between the local middle-man and the island producer, or between the crofter and the big estate, or again, between the land interest and the industrialised fishing islands or towns, or between sections of the same island, where, perhaps, racial traditions block the way to complete assimilation, or again, between different religious groups, each claiming divine rightness for its own doctrines. Such mental segregations and specialisations often block the way to successful administration. These, and such as these, are the motive forces that have generated the complex machinery of our existing administration. The variations in the machine are reflected in the long series of commissions and committees that have had to investigate every phase of social life in the Highlands and Islands. The reports are only a record of efforts to compose the struggles of these variously civilised groups to maintain themselves, first against nature and next against their domestic enemies. Only a generation or two ago, it was " war to the knife " in the literal sense. To-day the struggles are as keen, but the methods of fighting are more subtle. But the kind of fact we constantly run up against is this: that conscription made almost no difference to the island of Lewis, with its 28,000 inhabitants, because nearly all the men of fighting age had already joined some fighting unit of land or sea; or, again, that one of the island groups most affected with tuberculosis sent relatively high proportions of men to the Navy; or that, in one parish of some seven thousand people, there are said to be 22 " places of worship," representing at least four, if not five or six, Protestant denominations; or, once more, that the Highlands and Islands send to the Universities of Scotland from 10 to 12 times as many persons in proportion to population as the rest of Scotland. The last fact I learned many years ago from my last schoolmaster, Dr. Dey, late Rector of the Grammar School of Old Aberdeen, who had the arranging of secondary departments for the Highlands Committee. A tutor of Oriel College, Oxford, once told me that the best philosophical student he had had in 30 years came from Stornoway. Recently, a book on the nature of " community " came on the philosophical world from "a young Canadian professor," who went to Canada, via Oxford, from Lewis, and is now a professor in Columbia University. How easy it would be to load pages with such facts, or with flashes of beauty from the lochs or voes, or romantic tales of old adventure, or romantic songs from the living old world of music revealed to us by Mrs. Kennedy Fraser in her "Songs of the Hebrides"!

These things I name merely because they must be thought of as signs of the informing spirit whose organised embodiment for the purposes of our rough administrations we must state in crudely practical terms. Machines do not move of themselves, even Government machines. But the efforts of generation after generation to bring the Highlands and Islands within the working polity of modern Scotland make a pathetic record, whether we think of the suppressed clan system with its tribal wars, or the Scots Poor Law, beginning in 1424, and failing, by branding on the cheek, as it fails to-day by the poorhouse "test," to master or provide for the marginal citizen, or again, "the various crofter clearances," whose memory, in some glens and straths, is as bitter to-day as on the day they happened, or the abortive efforts to clean the islands of their people by emigration, or the failure of the potato crop, or the crofter's commissions, fisheries committees, medical committees, medical reports, attempted colonisations, medical service, and a dozen other things. These islands and glens have sent hundreds upon hundreds to the Western Continent, and to-day, among these mountains, we are in the neighbourhood of their descendants and we feel the atmosphere of the Scottish home. I have read something of the story of Daniel Boone (a man of Cornish stock) and the other pioneers, who fought their way from Pennsylvania down the valleys to the Yadkin and over these mountains into the heart of Kentucky, to help in forming the Commonwealth you now enjoy. I should like also to believe that, in these southern lands as well as in the harder north, the races and traditions of the Scottish Highlanders and Islanders have done something to help in the civilisations of the west.

FUNDAMENTAL UNITY OF THE SCOTTISH AND KENTUCKY PROBLEMS.

In one respect, the problem of the Kentucky mountains is essentially the same as the problem of the Scottish Highlands and Islands—namely, that the financial resources of the thinly peopled areas are rarely, if ever, sufficient to provide the same adequate services that the larger groups of population enjoy. That was the root of our problem in Scotland. It is the root of the problem in the Commonwealth of Kentucky. With us, it is largely a difficulty of the sea and its dangerous sounds, some of them impassable for weeks at a time. With you, it is largely a matter of land and river transport, where, however, the isolation may be just as great. Wherever we find the thinly populated islands or mountains, there we find difficulty in providing sufficient service. When we went the rounds of the Orkney and Shetland Islands, and the Hebrides, and many mountainous areas on the mainland, we had it said to us by many that the Highlanders were fatalists; that, in the last stages of life, they lost hope and were content to die, and that, therefore, medical or nursing service would be of little use. To a Highlander born in the Highlands this diagnosis of the social condition was only a proof of the Lowland failure to understand. How many a case I have heard of where the term "fatalism" was only a name for the proud personal independence that preferred death to the asking of favours! When, in the end, medical and nursing service has been provided, and the people feel that it is their own, they come forward in greater and greater numbers to utilise and enjoy the services provided through the State for themselves and their children. When the new movement began, even the doctors that went to the remote places were often deficient in training, or they were the men that had failed elsewhere. To-day, whenever a medical practice falls vacant anywhere, tens and twenties, and thirties and forties of medical men come forward, and the localities can choose from a highly trained body of medical practitioners. That is our answer to all that was said to us by the people that did not understand. You are having the same success as we had, and for the same reasons.

BIOLOGICAL GROUNDWORK OF MEDICAL AND NURSING SERVICE: OUR FIRST TWO YEARS.

But let us look behind the administrative machine. Why is it necessary to take such immense trouble with the first stages of life? Why should the young infant require of us so much more active help and tender consideration than the child of later ages? To this question it is not easy in a few words to give an adequate answer. For here we are face to face with the fundamental problem of social life. The solution of it involves all that the world knows of biological theory. There must be centred in the new-born infant some fundamental fact that makes it, at that stage, different from every other human being. The great miracle of birth is protected by the most powerful of human motives—the love of the mother for her child. It is a motive stronger than the fear of death. In all ages of the world, the love of a mother for her child has commanded the worship of mankind. If you think for a moment, you will understand that nothing less can preserve the life of the helpless new-born child. All our institutions for the welfare of mothers and their children have their taproot in the one great fact that, when the child dies, the race dies, and when the race dies, the great fight between life and nature is over.

It is, therefore, our duty to do what we can to guide the mother and child safely through the many dangers that threaten them in the months of expectancy and in the few critical days or hours of the confinement. If I chose, I could take from the records of the maternity hospitals long tales of damaged mothers, whose lives have been made miserable for ever by inadequate attention, or by unskilled handling, or by the necessity for the premature resumption of household duty, or by some other unfortunate combination of preventable causes. But we are not now thinking of the mothers affected with disease or deformity; we are thinking only of the normal expectant mother, who wishes to have no misgiving when the hour of her confinement comes, and who ought to have the organised care that is available to her only in the maternity home or at the hands of the scientifically trained doctor or nurse.

But there is a more fundamental reason for doing all we can to extend all the resources of the community to the care of the young human being. Consider what happens during the first year of a child's life. Its rate of growth is phenomenally rapid. For the first year, its rate of increase is 200 per cent. In its second year, the rate falls to 20 per cent. Until the age of 12, the percentage-rate of growth falls off, rising a little at 13, and then sinking until it comes almost to zero somewhere between 20 and 23. This is for boys. For girls the pace is not quite so rapid, but is practically the same. Recently, it has been held and, on the whole, demonstrated by biologists that senescence—that is, the process of growing old—varies in speed at different periods of life. Ordinarily, we are accustomed to think of senescence as applying only to men and women that have passed middle life. But it is now known that the process of senescence and rejuvenescence is a phenomenon applicable to all ages and to all growing organisms. Briefly, senescence is a process whereby the growing organism carries on with it certain products that ultimately clog the machinery and produce death. Through life, in various ways, there are periods of rejuvenescence, when those accumulated products may be thrown off and a person takes, as we say, a new lease of life. It is not possible here to discuss the theory fully; but the important point in it is that the process of senescence—that is, quite literally, the process of growing old and incapable of rejuvenescence—goes on most rapidly in the early years of life. As Mr. Charles Manning Child, of the University of Chicago, in his wonderful research on "Senescence and Rejuvenescence," puts it: "The rate of senescence is highest in youth and lowest in advanced life." The process of senescence is most rapid when the process of growth is most rapid. As, therefore, growth is most rapid in the earliest period of infancy, the child, during that period, may correctly be said to be racing at full speed into old age. Put otherwise, this means that in the period from conception to the end of the second year the child's organs and faculties become rapidly so fixed, that if his nurture through that period is not sound he will suffer disproportionately for all the rest of his days. Anyone that has watched the birth and nurture of young animals can tell you that if the infant animal does not get a good and correct start he never develops to the full stature or power of an adult. It is the same with human beings. Recently, too, the researches into diet have shown that the young and rapidly growing infant is peculiarly susceptible to the influence of extraordinarily minute quantities of particular food factors. The absence of an infinitesimal amount of a given substance will end in the production of rickets or scurvy. These well-known facts confirm the general conclusion of the biologists that the first months of life are of immense potency in determining the whole future course of individual development. Probably, if we could secure that our expectant mothers shall be properly fed and that they shall be fit to feed their new-born infants, we should not, later in life, have to spend fortunes in preserving our teeth or in procuring substitutes. That is only one very gross illustration of what I mean. But, broadly, the fact that the beginnings of all the child's organs are laid in the first few months after conception, and that the pace of his growth during the first year or two determines his healthiness or unhealthiness for the rest of his life, should alone be enough to justify us in focusing upon the early hours and weeks and months of infancy all the science and skill that we are able to command.

How Scotland has Faced the Problem of the Highlands and Islands.

It is not possible to give details of all our schemes. But the essence of the case is this: over 27 years ago we knew from experience that public health problems, like infectious disease, tuberculosis, typhoid fever, typhus fever, and the many others, could not be sufficiently provided for in the Highlands and Islands without national assistance. When the National Insurance Act of 1911 was passed, the Highlands and Islands, being largely a land of small holders, not of wage-earners, could not provide a sufficient population, even of insured wage-earners, to secure the benefits under the new Statute. It then became obvious to everybody in power, as it had been to the experts for years before, that, as in education so in health, the resources of the Highlands were inadequate for certain primary purposes. When, however, the first Insurance Act was passed, money was made available by Parliament and, on the basis of the Dewar Committee's Report, the Highlands and Islands Board was constituted. This Board was afterwards absorbed into the Scottish Board of Health. Parliament had voted a sum of £42,000 to accumulate year after year. This was before the war. Unfortunately, the difficulties of the war compelled us to stop the accumulation of capital and to expend it in such services as were possible in a time when every difficulty was at its greatest. Doctors by the score had to serve in the Army. We had to provide such substitutes as were available. But the large schemes we had prepared had to remain for a more favourable moment. Since the war, however, the projected developments are progressively appearing. In the year 1927, for example, we spent £70,000—that is, about 350,000 dollars—in the various medical services and nursing services. The primary objective of the whole system is so to adjust the service that the doctor shall be able to attend a patient 25, or 30, or 40 miles distant, or across a difficult sound or loch on the same terms as he would attend the people in his immediate neighbourhood. We aimed at eliminating from the charges the factor of distance. To do this we had to subsidise many doctors for their loss of fees. In other areas, single practice areas, we make up to the doctor a sufficient salary. In very poor areas we guarantee to the doctor a minimum salary that will attract good men and enable them to educate their families and to maintain their own professional education. In these types of service we spend £43,000 a year—that is, about 165,000 dollars. On nursing services we spend £13,300 a year, or over 66,000 dollars. We help with telegraphs and telephones. We subsidise the tuberculosis scheme. But perhaps the most important development of the whole system is the provision of operating surgeons for important localities. For instance, we provide a consultant operating surgeon for the Shetland group of islands, at a salary of about £900 a year, plus special earnings. In the Island of Lewis we similarly maintain an operating surgeon. In that island we have contributed £12,000 (60,000 dollars) to the extension of an admirable cottage hospital, which was opened a few weeks ago by the Under Secretary of State for Scotland. This serves a community of over 30,000 people. In both Lewis and Shetland these hospitals are maintained by voluntary subscriptions. A similar scheme is afoot for the Orkney group of islands. It is certain that in the next few years the scheme for providing operating surgeons will be extended. The young men appointed are carefully selected from the great medical schools. They must have a wide basis of surgical experience. It is gratifying to record that in the two instances up to date the people have come forward in a marvellous way. The operations performed run into hundreds. The medical men of the locality work cordially with the consultant surgeon. In all those island groups, also, there is a county medical officer of health, who sees to the medical examination and treatment of the school-children and the pre-school-children. The consultant surgeon thus becomes an integral part of the general medical and preventive service of the community. It is needless to say that all these medical services are supplemented by trained nurses. In fact, it is worth noting that in the Highlands and Islands Medical Service Act, under which Parliament voted the original grant, the term "medical service" specifically includes nursing service. So far as I know, this is the first time in a British Statute that nursing service has been included as a specific part of medical service. Doctors' houses and nurses' houses can be provided under the scheme and many such houses have been provided. Our aim is, where necessary, to provide at the nurses' house accommodation for one or more sick cases when the distance between her and her work is too great.

The Highlands and Islands medical service system began to operate effectively in 1914. Since that date to the end of 1927; we have spent nearly £660,000 (that is something over 3,000,000 dollars). Of this total, nearly £500,000 (say, 2,500,000 dollars) has been spent on medical service alone. Nursing associations have been subsidised to the extent of £95,000 (say, 475,000 dollars). The full details of all the scheme are in a form that can be easily studied by any person concerned with similar problems. This is what the small Northern Kingdom is doing for a handful of 320,000 people.

The Frontier Nursing Service.

I have been speaking of Scotland, but I have been thinking of Kentucky. With you, as with us, the mother and child demand intensive care. With you, as with us, there is the ever-recurring tragedy of hardship and death. Think what it means when a family loses the mother. The infant is robbed of its nurse; the other children are robbed of their first friend and teacher; the husband is robbed of his companion and confidant. The death of the mother means the maximum of unhappiness to the family she leaves. It is in this light that we must study the facts and in this light the facts are like no others. To preserve the life of mother and child is the problem before the Frontier Nursing Service. It needs only to be put into words to command the interest and sympathy of every humanist.

This hospital is the radiating centre of the nursing service in these mountains. The maxim of the trained nurse is: "You need me? I am ready." The hospital is a temple of service where the lamp never goes out. There will always be a waking ear listening for the distant cry of a mother in distress. There will always be an officer ready to go forth in the spirit of help and loving kindness. Here, in this temple of humanism, every hour is filled with a clear ideal. The mothers and the fathers know that here they have friends that they can come to and speak to, and live with. Through these mountains and forests, the Frontier Nursing Service will become a gracious presence transfiguring the individual lives. It makes an appeal that no one in the end can resist. The service draws its life from an unfailing fountain of human sympathy and love. That is what inspires the skilled and brave nurses to face the day's duty without misgiving; to feel that the least of duties is a great and holy thing and to live for all their working days in the atmosphere of creative friendship. Here, in their hours with one another and their tales of adventure, they will keep warm the fires of woman's social genius. They will always feel that, here on the frontier outposts, they are living out the true purpose of the Commonwealth—to prepare a worthy and dignified place for every child born to it.

ACT OF DEDICATION.

In all reverence, I dedicate this hospital to the service of this mountain people. The act of dedication will have consequences beyond all imagination. It will evoke responses along the many hundred miles of these mountain frontiers and among the millions of their people. The beacon lighted here to-day will find an answering flame wherever the human hearts are touched with the same divine pity. Far in the future, men and women, generation after generation, will arise to bless the name of the Frontier Nursing Service.

RADIUM TREATMENT OF PRIMARY CARCINOMA OF THE BREAST.*

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(*With Illustrative Plate.*)

THE Surgical Professorial Unit at St. Bartholomew's Hospital, under the direction of Prof. G. E. Gask, was entrusted in 1922 with a supply of radium to be used under research conditions for the treatment of carcinoma of the breast. For three years this was used only for the treatment of recurrences which had appeared after operation. The results were instructive if unsatisfactory, for it was shown that a nodule of carcinoma could be made to disappear by local treatment with radium, although it hardly ever prolonged the patient's life, the disease having been already disseminated to more distant parts. This preliminary experience justified the extension of the treatment to primary carcinoma of the breast, and the first patient in this category was treated in August, 1924. Up to the end of June, 1928, 42 patients had been treated.

The technique and the principles of its application were tentative in the beginning, and it is unnecessary to describe in detail the stages through which they passed. The main directions in which they developed have been: (1) to distribute the dose in smaller units; (2) to prolong the time of exposure; (3) to increase the area treated; (4) to extend the routine treatment of the areas of lymphatic drainage until every accessible area was receiving what appeared to be an adequate dose.

Technique.

The technique used at the present time (July, 1928) is as follows:—

1. The patient is anæsthetised with gas and oxygen. It is seldom necessary to use any additional kind of anæsthetic.

2. The skin of the chest wall, axilla, and most of the neck is thoroughly cleaned with ether.

3. A series of punctured wounds are made in the skin round the site of the carcinoma with a pointed scalpel (Bard Parker blade No. 11). These punctures are about 1·5 cm. apart, and placed so that when the longest needles have been inserted the whole of the carcinoma and a considerable area surrounding it will be evenly illuminated by the radiations. Sometimes the intensity is increased by inserting the needles at two different levels in directions at right angles to one another (see diagram) so that a "grid" of needles is formed. If this greater intensity is likely to cause burning of the skin by reason of the thinness of the patient, or to cause massive sloughing of the growth by reason of its avascularity or of its being already ulcerated, only a single layer of needles is inserted.

4. Similar punctures are made for the insertion of needles into (*a*) the axilla; (*b*) beneath the pectoralis major; (*c*) above the clavicle; (*d*) below the clavicle; (*e*) over the first three or four intercostal spaces.

5. Needles of suitable length are then inserted (*a*) into the axilla with their points converging into the apex, so that the axillary glands will be illuminated by a cone of needles; (*b*) beneath the pectoralis major if there is a considerable space between the primary growth and the axilla; (*c*) deep to the superficial veins of the neck and deep cervical fascia so as to be in contact with the supraclavicular glands; (*d*) deep to the pectoral muscle on the costo-coracoid membrane; (*e*) obliquely into the intercostal spaces so as to be in contact with the parasternal or internal mammary glands.

6. Before the needles are inserted, each has a strand of salmon-gut threaded through the eye and knotted once. These are allowed to protrude from the punctures in the skin, and are knotted in bunches, so that if a needle comes out of place it will remain attached to the others, and will not be lost.

7. The skin is cleaned and the area under treatment is covered with gauze, which is secured in position by broad strips of adhesive rubber strapping. This overlaps the gauze all round, and forms an additional safeguard against the loss of needles. The whole is covered with wool and bandaged.

8. The needles are allowed to remain in position for at least a week, and sometimes for as long as ten days if the tumour is a large one. They are then removed under gas and oxygen anæsthesia. A specimen for microscopic section has been taken at the same time in every one of the present series, since it was necessary to have full proof that the tumour was a carcinoma. This was taken after irradiation rather than before in the belief that implantation of the growth in the incision was less likely to occur.

9. Whenever possible the patients were examined at monthly intervals for the first year. Thereafter the intervals might be lengthened to two or three months. Otherwise a report was obtained from the patient's doctor. The majority of the patients have been consistently kept under my personal observation.

10. A few patients were submitted after about three months to a second treatment with radium, and one patient received three applications.

Details of Apparatus.

For the adequate treatment of primary carcinoma of the breast it is advisable to have available 95 mg. of radium element. For some cases 60 or 70 mg. is enough, but for the larger tumours more is needed. The greater part of the radium, in the form of radium sulphate, should be contained in platinum needles each containing 3 mg. distributed along an active length of 4·8 cm. Experience has shown that needles of this size are convenient and give good results, though it is, of course, not essential that they should have exactly these measurements. These long needles are used for irradiating the tumour and the axillary lymph glands. A few shorter needles containing 2 mg. radium element with an active length of 3·2 cm. are needed for the supra- and infra-clavicular regions and the intercostal spaces. The platinum case of each needle should have a thickness of about 0·5 mm. The stock of needles should therefore be made up approximately as follows:—

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* Being the basis of a communication made to the International Cancer Conference on July 19th.

Number.	Ra element content.	Active length.	
25	3 mg.	4·8 cm.	95 mg.
10	2 mg.	3·2 cm.	

A typical distribution of needles is shown in the accompanying diagram.

It is convenient to have three forms of introducer for placing the needles in position. Two of these are large forceps on the principle of the Spencer-Wells hæmostat with grooves cut in the jaws so that the needles can be gripped without damage. One holds the needles in the line of the forceps, the other holds them at right angles. A third introducer may be useful when a needle has to be placed at some distance from the skin, or when the tissues are very tough. This is made on the principle of the trocar and cannula. The trocar is made to project more than the full length of the needle beyond the cannula. When the trocar is withdrawn the needle is pushed by a stile along the cannula and into the track made for it by the trocar.

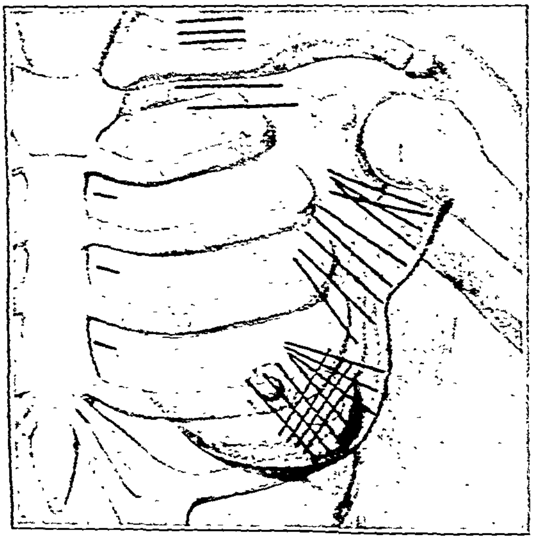


Diagram showing typical distribution of radium needles. (From a drawing by T. L. Poulton.)

Patients Treated.

When the investigation was in its initial stages it was clearly right to treat only those patients who seemed to be unsuitable for operation owing either to the position of the growth or to its being adherent to the chest wall. Later, as confidence in the treatment was engendered by the results, patients who formerly would have been submitted to operation were treated with radium, and there has been no reason to regret this. It may be pointed out, however, that on the whole the class of patient treated has been very unfavourable as regards prognosis, and this must be remembered in judging the results.

Results.

(*a*) *Primary Growth.*—The effect of irradiation upon the primary growth usually begins to be plainly seen within a fortnight of the insertion of the needles. The tumour becomes smaller and less fixed and ulceration tends to heal. In a favourable case this shrinkage is progressive until at the end of about three to four months no tumour can be detected. If at the end of four months a tumour is still present and seems to be stationary, a second treatment may be given or occasionally a local excision of the residual mass is performed. In one case a third treatment was given 18 months after the first, which resulted in the final disappearance of the tumour.

(*b*) *Lymphatic Glands.*—In the majority of the patients treated the only enlarged glands that were detected were in the axilla, the rest of the treatment given to lymphatic areas having been prophylactic. The effect on the enlarged glands has been uniformly satisfactory. Usually they have disappeared entirely, even when they had been very large, leaving no trace or only a slight thickening where they had been. So far no recurrences have taken place in any of the lymphatic areas treated prophylactically. The intercostal spaces have been irradiated only in the more recent cases.

Statistics.

Up to the end of June, 1928, 42 patients have been treated. One of these was a male. All were proved by histological examination to have carcinoma of the mammary gland. The operability was as follows: inoperable, 17; operable, 22; doubtful, 3.

Of the inoperable class six died of metastatic growths. None of these lived more than nine months after treatment, though all had shown local improvement and in two the primary growth had entirely disappeared. One (the only male) died of intercurrent disease after having been apparently cured for one year and seven months. One patient reckoned operable, though very unfavourable, died of septicæmia some weeks after local removal of the breast following two radium treatments, the carcinoma having recurred outside the area treated. Of the 34 patients that are alive, two are known to have metastases in bones and four have recurrences. In two the recurrences are in the area treated, in two outside it. Of the 28 patients that remain:—

Apparently cured	13
Tumour almost gone	1
Greatly improved	2
Improving	7
Recent (within 3 months)	5

In the cases of the 13 patients who are "apparently cured," the following times have elapsed since the first treatment:—

One, 4 years; one, 3 years 2 months; one, 2 years 2 months; one, 2 years; one, 1 year 11 months; two, 1 year 5 months; one, 11 months; one, 10 months; two, 9 months; two, 8 months.

The term "apparently cured" may be taken to mean that the primary tumour and axillary glands, if any were detected, have disappeared; in some the tissues seem to have returned to normal, but in others the destruction of the carcinoma has left some scar tissue in its place.

Of the 13 patients in this category there were: inoperable, 6; doubtful, 1; operable, 6. Among the four longest "cures" (two years and upwards), three patients were "inoperable." One of these (two years) had a large growth with a secondary mass filling the axilla. Radium was applied three times, and the successive stages in the disappearance of the tumour are shown in the photographs on the Special Plate. The patient has gained in weight and general health and has been a startling example of the results that may be obtained with radium in an apparently hopeless case. The patient who has been "cured" longest (four years) had a small growth, which was excised locally after treatment with a dose of radium now to be regarded as inadequate. She was the first patient treated and I should anticipate that excision in such a case would not now be necessary, as exemplified by the third patient treated (apparently cured three years and two months).

In order to reduce this statistical survey to its simplest terms, it will be best to eliminate the recent cases, and the single patient (although apparently cured) who died of intercurrent disease. This leaves 26 patients in whom something approaching a *result* may be claimed of not less than eight months' duration. The results are then as follows:—

Apparently cured	13*
Died of metastases	6
Alive, with metastases	2
Alive, with recurrences	2
Died following recurrences	1

* Inoperable or doubtful 7, operable 6.

A good result, therefore, has been obtained in half the patients treated, although only seven out of 26 could be regarded as operable. Of the seven operable patients, six are apparently cured. As the proportion of operable cases increases, the results may be expected to improve correspondingly. It is, perhaps, permissible to emphasise the fact that of 17 patients with inoperable or doubtfully operable growths seven are apparently cured. Some of these will no doubt succumb later on to metastatic growths in other parts of the body, but in the meantime the benefit which they have received cannot be questioned.

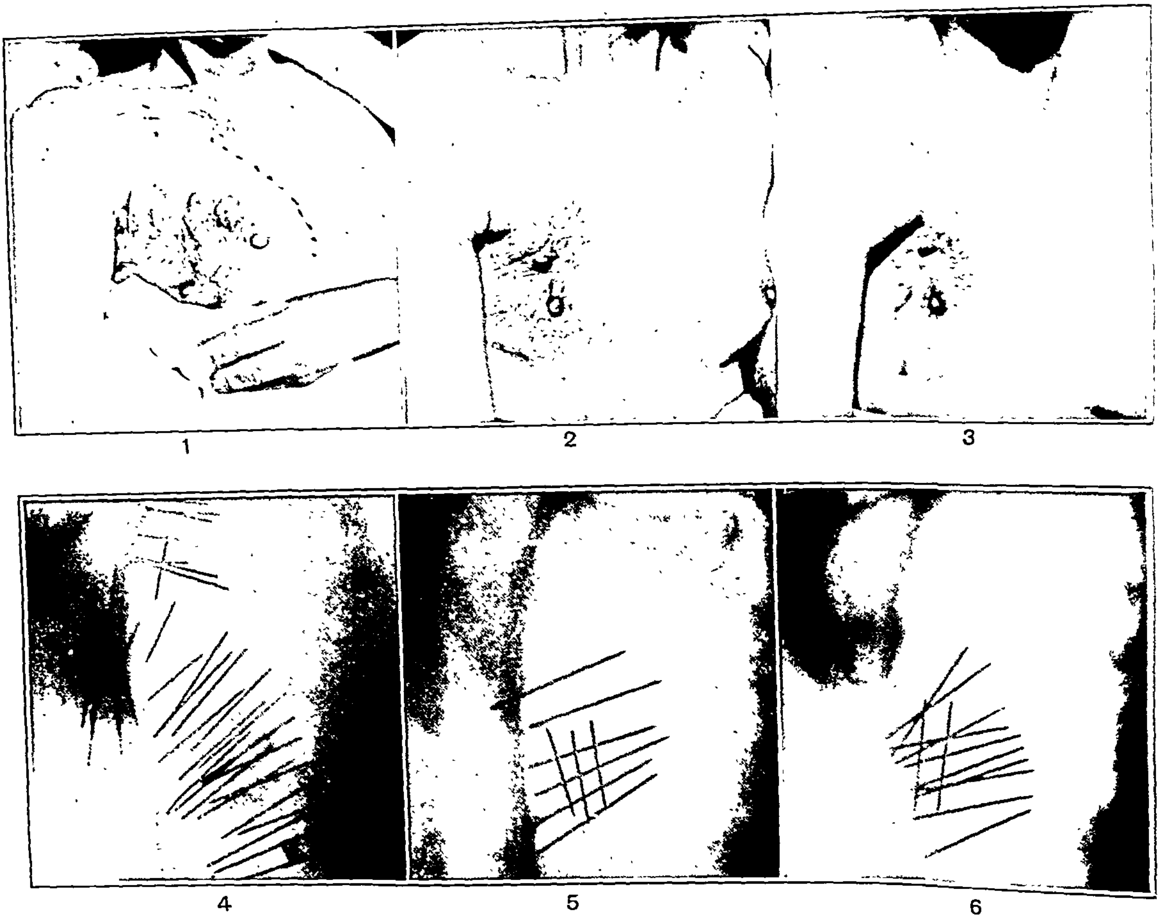
Histological Evidence.

As already stated, histological evidence of the nature of the growth has been obtained in every case. This was simply in order to prove that carcinoma was present, and only a very small specimen was taken

TABLE GIVING RESULTS OF RADIUM TREATMENT OF PRIMARY CARCINOMA OF THE BREAST.

Cases 10, 24, and 27 are Illustrated on the Special Plate.

No.	Date of (first) treatment.	Type of case.	Axillary gland.	Treatment.	Result.
1	August 1st, 1924.	Ulcerated; scirrhous. Inoperable.	−	Radium (3) and excision of scar.	Apparent cure 3 years 11 months.
2	Jan. 29th, 1925.	Contracting; scirrhous. Inoperable.	−	Radium (2) and excision of scar.	Apparent cure 3 years. Recurrence in scar 3 years 2 months.
3	May 5th, 1925.	"	+	Radium only.	Apparent cure 3 years 2 months.
4	May 1st, 1925.	Massive growth. Inoperable.	−	Radium and removal of breast.	Local improvement. Died of metastases 8 months.
5	June 11th, 1925.	"	+	Radium and deep X rays.	Local improvement. Died of metastases 2 months.
6	July 10th, 1925.	Ulcerated; scirrhous. Inoperable.	+	Radium only.	Disappearance of tumour. Died of metastases 6 months.
7	August 12th, 1925.	Massive growth. Inoperable.	+	Radium only (2).	Local improvement. Died of metastases 9 months.
8	March 23rd, 1926.	Scirrhous. Operable.	−	Radium only.	Apparent cure 1 year 7 months. Died of abdominal tuberculosis.
9	May 18th, 1926.	Small growth. Operable.	−	Radium and excision of scar.	Apparent cure 2 years 2 months.
10	July 13th, 1926.	Massive growth. Inoperable.	+ +	Radium only (3).	Apparent cure 2 years.
11	August 6th, 1926.	Contracting; scirrhous. Inoperable.	−	Radium only.	Apparent cure 1 year 11 months.
12	Nov. 19th, 1926.	"	+	"	Recurrence beyond area treated 1 year 7 months.
13	Dec. 21st, 1926.	Contracting; scirrhous. Operable.	+	Radium (2) and local excision.	Death from septicæmia after excision 1 year 3 months.
14	Feb. 10th, 1927.	Massive growth. Inoperable.	−	"	Apparently cured 1 year 5 months.
15	Feb. 17th, 1927.	Ulcerated; scirrhous. Operable.	+	Radium only.	Apparently cured 1 year 5 months.
16	April 14th, 1927.	Massive growth. Operable.	+	Radium only (2).	Disappearance of tumour. Recurrence in pectoralis muscle 11 months.
17	May 20th, 1927.	Ulcerated; scirrhous. Inoperable.	+	Radium only.	Died in infirmary 9 months.
18	June 18th, 1927.	Massive growth. Operable.	+ +	Radium only (2).	Great local improvement. Died with metastases 9 months.
19	August 2nd, 1927.	Contracting; scirrhous. ? operable. Mass in axilla.	+ +	Radium only.	Apparently cured 11 months.
20	August 9th, 1927.	Scirrhous. Inoperable.	+	Radium only (2).	Recurrence outside area treated. Original tumour disappeared 11 months.
21	Sept. 20th, 1927.	Ulcerated; scirrhous. Operable.	−	Radium and excision of scar.	No recurrence 10 months.
22	Oct. 25th, 1927.	Small growth. Operable.	−	Radium only.	Disappearance of tumour 9 months.
23	Oct. 25th, 1927.		−	"	"
24	Nov. 4th, 1927.	Ulcerated; scirrhous. Inoperable.	+	"	Disappearance of tumour 8 months.
25	Nov. 30th, 1927.	Massive growth and mass in axilla. ? operable.	+ +	"	Not seen again. Has metastases in bones.
26	Dec. 16th, 1927.	Medium growth. Operable.	−	Radium only (2).	Disappearance of tumour 8 months.
27	Dec. 16th, 1927.	Ulcerated; scirrhous. Inoperable.	+	Radium only.	Healed. Tumour almost gone 8 months.
28	Jan. 6th, 1928.	Small growth; large masses in axilla. Inoperable.	+ + +	"	Tumour gone. Axillary glands much smaller. Metastases in spine 6 months.
29	Feb. 10th, 1928.	Massive growth and skin nodules. Inoperable.	+ +	X ray treatment, Ovariotomy, radium.	Improving 5 months.
30	Feb. 17th, 1928.	Medium growth. Operable.	−	Radium only.	Disappearance of tumour 5 months.
31	March 30th, 1928.	Massive growth. Operable.	−	"	Improving 4 months.
32	April 18th, 1928.	Medium growth. Operable.	+	"	"
33	April 20th, 1928.	Medium growth. Nipple ulcerating. Operable.	+	"	"
34	April 27th, 1928.	Massive growth. ? operable.	+	"	Improving 3 months.
35	April 27th, 1928.	Massive growth. Operable.	−	"	"
36	May 11th, 1928.	Ulcerated; scirrhous. Operable.	−	"	Improving 2 months.
37	May 18th, 1928.	Small growth. Operable.	+	"	"
38	June 1st, 1928.	Massive growth. Operable.	−	"	Improving 1 month.
39	June 8th, 1928.	"	−	"	"
40	June 8th, 1928.	Adherent growth. ? operable.	−	"	"
41	June 22nd, 1928.	Massive growth; ulcerated. Inoperable.	+	"	"
42	June 22nd, 1928.	Medium growth. Operable.	+	"	"



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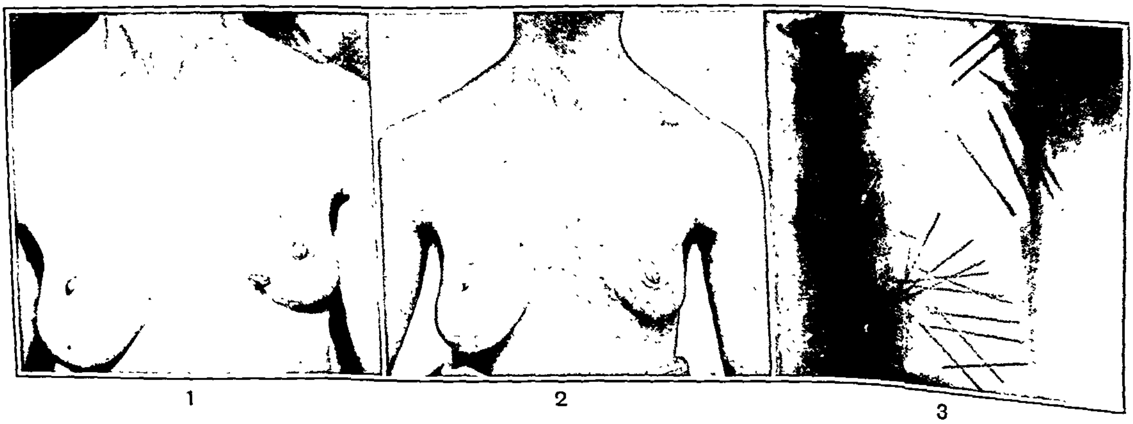

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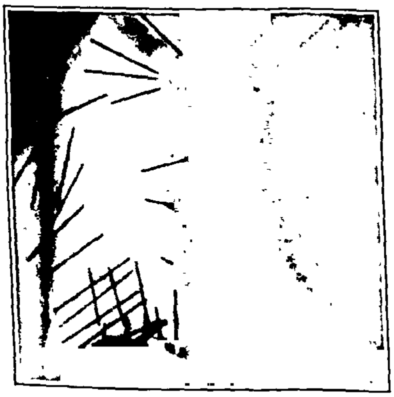
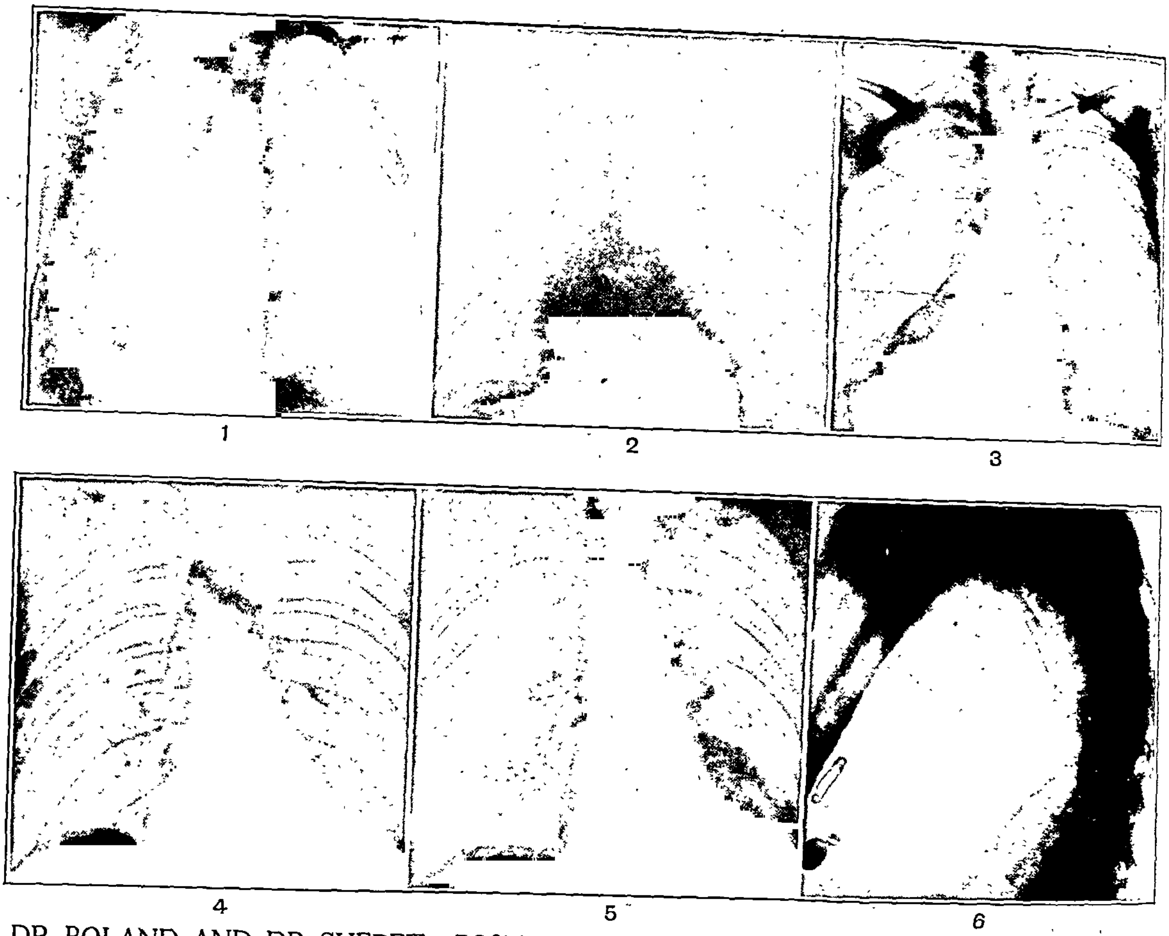


A. Case 10, inoperable carcinoma, apparently cured, in three stages: (1) 23.vii.1926, shortly after first insertion of radium; (2) 2.v.1927, before second insertion; (3) 3.vii.1928, six months after third insertion; (4), (5), (6) showing the three stages in the insertion of radium, on 14.vii.1926, 6.v.1927, and 19.i.1928, respectively.

B. Case 24, scirrhous carcinoma, fixed to chest wall, apparently cured: (1) 3.xi.1927, before treatment; (2) 13.ii.1928, four months after insertion of radium, no tumour remains; (3) 4.xi.1927, showing distribution of radium.

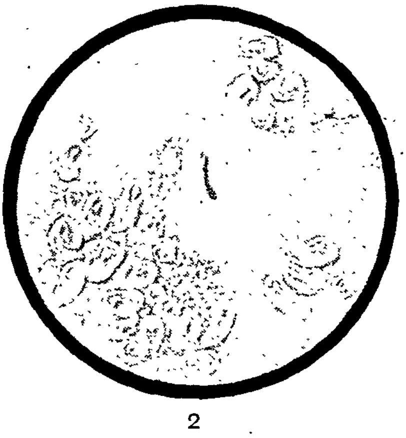
C. Case 27, insertion of radium 16.xii.1927, showing distribution of needles.

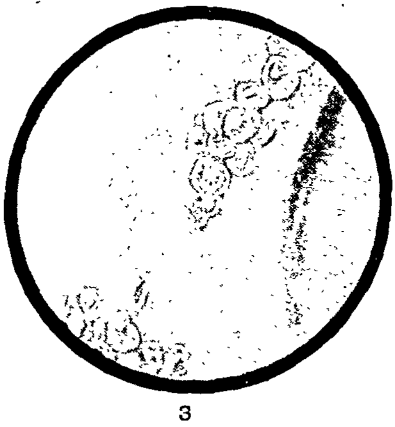
MR. GEOFFREY KEYNES: RADIUM TREATMENT OF PRIMARY CARCINOMA OF THE BREAST.

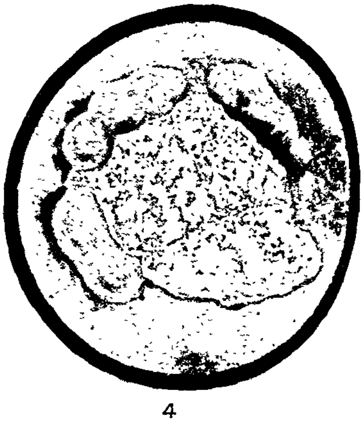


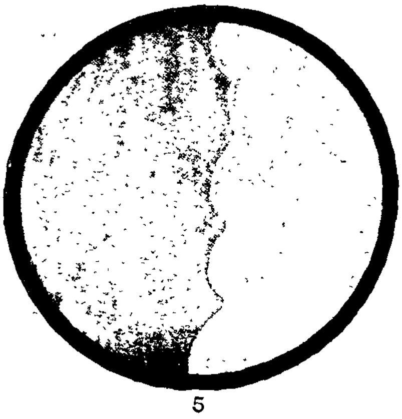
DR. BOLAND AND DR. SHERET: POST-OPERATIVE MASSIVE COLLAPSE OF THE LUNG.

(*References in the text.*)









FIGS. 2 and 3.—Cystoscopic appearance of the mucous membrane of the bladder three months after irradiation of a malignant growth.

FIG. 4.—Ulcerating growth of the whole of the left lateral wall of the bladder three months after treatment with radium. Note the raised edge surrounding the mass of dead growth.

FIG. 5.—Bullous œdema of the left half of the internal meatus of the bladder following radium treatment for carcinoma.

MR. CLIFFORD MORSON: RADIUM TREATMENT OF VESICAL CARCINOMA.

from the most superficial part of the growth. Knowing how much the histological appearance of a carcinoma varies in different parts of the tumour, I have not thought it worth while to make any attempt to correlate the results with the morphological type as seen in the specimens removed.

If the response to irradiation seemed to be satisfactory, no surgical operation was performed. In a few instances excision of the area treated was carried out. In the two patients first treated, although great improvement had resulted, the area treated was excised in order to obtain information. Both specimens were found still to contain some carcinoma cells, but both had received what I should now regard as an inadequate dose. In spite of this, one of the patients is still quite well after the lapse of nearly four years. The other has recurrences. In a patient treated somewhat later in the series (No. 4), a massive growth was excised five and a half months after treatment of its deep surface with radium. Sections of the irradiated surface of the growth showed that very few carcinoma cells remained in this part, though there was more carcinoma still active at a greater distance from the radium. The tissues undoubtedly protect those cells which are on that side of the tumour most distant from the radium, and it is not always possible to expose every cell to a lethal dose. This screening effect was interestingly shown in a patient who had a massive inoperable growth with discoloured bosses on the skin surface (No. 14). After two radium treatments the bosses had disappeared and the whole tumour was greatly reduced in size. There was, however, a residual mass after nine months which I thought it was wise to excise. Cross-sections through the specimen showed that it consisted almost entirely of fibrous connective tissue from which all evidence of carcinoma had disappeared, *except* for a few cells immediately under the epidermis. These cells were not normal in appearance and perhaps might have disappeared later; in any case the excision has proved satisfactory, and the patient is quite well after one year and five months. A similar residual lump excised from another patient, one year and four months after radium treatment, was found to consist of fibrous connective tissue only and no trace of carcinoma could be discovered.

Local excision has been called for in comparatively few patients, and the histological evidence is necessarily incomplete. It has, however, served to demonstrate both the partial and complete destruction of a carcinomatous growth by radium.

Advantages of Radium Treatment.

The insertion of radium needles is a trivial operation compared with Halstead's operation, and can usually be done under gas and oxygen anæsthesia. The mortality-rate should be nil. In a favourable case an apparent cure can be effected without any mutilation whatever. The lymphatic drainage can be dealt with more extensively with radium than by dissection, since it is possible to treat effectually not only the axilla, but also the supra- and infra-clavicular regions and the intercostal spaces. In no case hitherto treated has any œdema of the arm followed the application of radium. Radium can be applied with benefit to all but the largest tumours, and an apparent cure can be effected in a considerable proportion of cases which are unsuitable for any operation.

Disadvantages of Radium Treatment.

The cost of radium is at present so high that a capital outlay of £1500 is necessary for treating one patient at a time; but the stay in hospital is usually not more than ten days, so that at least twice as many patients can be treated by radium as could be treated by operation with the same hospital accommodation in the course of a year. It seems to be impossible to avoid causing in some patients a superficial skin burn, particularly in those who are thin. This results in some discomfort for several weeks, but no permanent disability results. Occasionally a very vascular tumour has sloughed away leaving an ulcer which is slow to heal. Perhaps further experience with the regulation of the dosage may lead to avoidance of this trouble.

Conclusion.

The published statistics of the end-results of the treatment of carcinoma of the breast by operation have not been very encouraging. One of the most convincing statistical reports of recent years is that compiled by J. F. C. Braine and Grant Massie and published in the *Guy's Hospital Reports* for 1926. Of the 338 cases there traced, 54 per cent. were alive at three years after operation and only 28 per cent. were alive at five years. The average of the figures published by 23 authorities from 1896 to 1926 gives a survival-rate of 41·4 per cent. for five years. If, therefore, a method other than operation is adopted, it will not find itself in competition with any very efficient means of treatment, and the results will be bad indeed if they are worse than those of operation. Furthermore, the Guy's Hospital statistics have shown that "the average period of survival is inversely proportional to the magnitude of the operation." This statement is in a sense fallacious, since it is probably true only of the advanced cases such as are commonly seen in hospital practice; yet it is clear that operation introduces a factor adverse to the patient's interests, and it might be expected that any other treatment which is locally effective will produce better results in the end. Even if the results of alternative treatment were only as good as those of operation, an alternative which rendered removal of the breast unnecessary would obviously be preferred.

I am not aware that any treatment has yet been introduced for which the claim has been made that it is better than operation for the average case of carcinoma of the breast. In the present article I have tried to describe the results of a method of treatment with radium which seems to promise results comparable with, or even better than, those of operation. Many years must elapse before a final opinion can be expressed, but the results are sufficiently remarkable to suggest that their publication should not be any longer delayed.

Several of the patients treated were referred to the surgical unit by other members of the surgical staff at St. Bartholomew's, and to them my acknowledgments are due.

POST-OPERATIVE MASSIVE COLLAPSE.

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(*With Illustrative Plate.*)

THE fact that abdominal operations may be followed by pulmonary complications has been recognised since the dawn of abdominal surgery, but despite steady advances in surgery the only tangible addition to our knowledge of the abnormal processes in the lung has been the recognition, in 1908, by William Pasteur,[1] of massive collapse. This Pasteur described as a condition in which extensive areas of lung tissue, varying in size from a large portion of one lobe to a whole lung, became quite airless, blue and obviously shrunken, and sank immediately in water. The characteristic physical signs were purely mechanical accompaniments of the loss in volume, to make up for which the chest on the affected side became retracted and immobile, and the heart and mediastinum moved towards the affected side. So vehemently did Pasteur insist that massive collapse could only be suspected in the presence of this cardiac displacement that post-operative pulmonary complications have ever since fallen into three main groups.

The first is composed of cases exhibiting the essential signs of massive collapse as described by Pasteur. The second comprises cases which were regarded as post-operative pneumonia, because cardiac displacement could not be demonstrated. The third includes a few easily recognisable complications, notably those of embolic origin.

Our investigations very early showed that post-operative pneumonia is almost a chimera and that the distinction between the first two groups is little better than a shibboleth. In other words, the vast majority of all complications are massive collapses, which may or may not be accompanied by demonstrable cardiac displacement.

We followed the convalescence of 261 patients from abdominal operations of all grades of severity, with reference to the possible occurrence of declared or latent alterations in the lungs. All the cases were nursed in a more or less fully developed Fowler position.

The X Ray Appearance.

Although the physical signs of massive collapse, whether or not accompanied by demonstrable cardiac displacement, are very characteristic, its most striking manifestations are in the radiographic films, particularly when it affects the whole of one lung. (Fig. 1.)[3] The shadow cast by the airless lung is at least as dense as that caused by a thick layer of fluid, and may even obscure the rib outlines. The cardiac and mediastinal shadows, including that of the trachea, are much displaced towards the affected side, the diaphragm is elevated, and the ribs fall together so as to assume a tiled appearance.

When one or other lower lobe is involved alone, the shadow is equally dense and occupies a triangular area which, on the left side, may be almost completely overlapped by the heart. This area always indicates by its size that the affected lower lobe is much diminished in volume and, when cardiac displacement is demonstrable clinically, the degree of migration of the mediastinum and tiling may be as extensive as when the whole lung is collapsed (Fig. 3). More often the evidence of displacement is so slight as to render clinical detection impossible, and quite frequently it is entirely absent (Fig. 5). A lateral view, however (Fig. 6), shows at once that the whole lower lobe is far more shrunken than would be suspected from an antero-posterior view, and that it is completely pushed back into the posterior costo-phrenic angle by the aerated upper lobe. For the diagnosis of massive collapse, therefore, we come to Dr. Twining's[2] suggestion that we should rely on evidence of displacement of the interlobar septum, as seen in the antero-posterior and lateral views, and not on mediastinal displacement.

The first indication of the onset of massive collapse is a mottled appearance in the lung, developing during the first 24 hours after operation (Fig. 4). We have only once watched this go on to a collapse associated with marked mediastinal and cardiac displacement, because the collapse was usually fully established at the time of the first examination, but it has occurred with great frequency in the earliest stages of those cases which do not subsequently show displacement clinically. This mottling nearly always occurs in the lower lobes only, on one or both sides, and appears to be due to areas of lobular collapse, which coalesce to form massive collapse, usually of the whole lower lobe. Nevertheless, it often clears up rapidly; this may happen in one lower lobe, while the other goes on to complete collapse in a few hours. When both lower lobes are collapsed there is usually no cardiac displacement, while if one is completely collapsed and the other merely mottled, the heart is often slightly displaced towards the side of the complete collapse. This is particularly common when the right side is the more affected, since there seems to be a general tendency for displacement to occur more readily towards this side.

When the lung becomes aerated again it sometimes fails to return at once to its normal volume (Fig. 2). Its shrunken condition is partly maintained by the mechanical conditions in the pleura, which are altered by the emphysema in the upper lobe, and partly by the effects of inflammatory changes, which may show themselves in pleural thickening (Fig. 2), and the persistence of small areas of opacity in the hilum region, presumably due to residual consolidation.

Incidence and Distribution.

The table shows the incidence of pulmonary collapse in our series. Of the six cases which fulfilled Pasteur's description by giving marked clinical evidence of cardiac displacement, one affected the whole right lung and one the whole left lung, the others being confined to the right lower lobe. The number of patients in whom this picture occurred (6 in 226, or 2·3 per cent.) gives a fairly accurate indication of its frequency, since it represents a mean between the 0·6 per cent. and the 0·2 per cent. of Scott and Culter[30] in different institutions and that of Mastic's, Spittler, and McNamee[31] of about 7 per cent. There is a general tendency in this group for the right side to be more frequently affected than the left. There is usually a higher incidence among males than among females, but this is not revealed by our figures. Of the cases which showed no cardiac displacement clinically, 11 were bilateral, 10 involved the left lower lobe, and 9 the right lower lobe. We have never seen the upper lobes affected except when the whole lung has been involved.

The anæsthetic used or its method of administration—in these cases usually ether by the open method or from a Pinson's bomb—do not appear to bear any relationship to the frequency of pulmonary complications and, except that very young children are rarely affected, age does not appear to be a predisposing factor, but we feel certain that they are much more common when the weather conditions are adverse.

Ætiology.

Every mechanism which could probably bring about the deflation of the lungs has been evoked, with minor modifications, by different observers, and the question still remains unsettled. Pasteur, having originally recognised massive collapse in cases of post-diphtheritic paralysis,[3] felt certain that failure of the inspiratory mechanism was the essential cause of the condition, and the observation that after abdominal operation the whole diaphragm might be immobile without any abnormality in the lungs influenced him only to the extent of stating his theory as follows:—

> "A stimulus of unknown nature arising in one half of the body arrests the distending action of the corresponding half of the diaphragm to such a pitch that the compressors of the lower lobe on that side take charge, causing it to collapse in a manner already described."

Rose Bradford[4] considered that some reflex was operative and that the retraction of the chest wall was active rather than passive. At the same time he saw obstacles in the way of accepting Pasteur's views, and believed that, with the arrest of respiration in extreme expiration, the alveolar air was not sufficiently renewed and was absorbed by the blood stream.

Briscoe,[5] after an exhaustive research into the mechanism of respiration in the erect and supine postures, formulated a theory which differed from Pasteur's only in the supposition that the diaphragm and its synergic and antagonistic muscles were in abeyance because of posture and an inflammatory lesion in the region of the crura. Scrimger,[6] satisfied that respiratory paralysis could not cause massive collapse, considered that *some* reflex mechanism brought about a spasm of the bronchioles which was followed by absorption of the alveolar air. Scott[7] favoured a similar mechanism but preferred to believe that the reflex acted on the vessels in the bronchiole wall, which became so dilated as to obstruct the lumen. Sante,[8] who also considered that the primary cause was a reflex one, thought that it might act by causing paralysis of the bronchiole wall so that it collapsed, its walls being then held in apposition by secretions. Elliott and Dingley[9] also failed to produce collapse of the lung by complete destruction of the respiratory mechanism, and considered that it came about because of the pure accumulation of secretion in the bronchial tree. This theory has received the support of Jackson and Lee,[10] Hearn and Clerf,[11] and several other observers on purely clinical grounds.

Massive collapse occurs in debilitated children and in people suffering from bronchitis, also after severe injury of the trunk without fracture of the ribs; in portal pyæmia [1]; after thyroidectomy [12]; in cases of pneumonia elsewhere in the lung[1 13]; after gunshot wounds in the chest, abdomen and buttocks.[4 11 15 16]

Table showing Incidence of Pulmonary Collapse.

—	Cases.	Displacement		Percentage.
		With*	Without†	
MALES.				
Operations through upper abdominal paramedian incision ..	58	0	17	29·3
Grid-iron incision	40	3	4	17·5
Hernias and lower abdominal paramedian incisions	51	0	3	6
Total	149	3	24	18·1
FEMALES.				
Upper abdominal paramedian incisions	35	1	5	17·1
Grid-iron incisions	42	2	0	4·7
Hernias and lower abdominal paramedian incisions	28	0	0	0
Nephrectomy and nephrotomy ..	7	0	1	14·3
Total	112	3	6	8
Grand total..	261	6	30	13·7

* Cases with displacement conforming to Pasteur's description.
† Cases without demonstrable displacement.

It has been recorded in a case of anterior poliomyelitis[17]; in one of infective meningitis,[18] with pulmonary tuberculosis[19] following high transverse lesions of the spinal cord[5]; and in association with obvious occlusion of the bronchi by tumours, aneurysms, and foreign bodies. It seems, therefore, at the outset that any factor such as the administration of a general anæsthetic, interference with the abdominal contents or parietes, and prolonged rest in one position, which are constantly present in post-operative cases but in the absence of each and all of which massive collapse is known to have occurred, can at most only be important as contributory to some definite cause which is common to all cases.

Although Schroeder and Green[20] reported that massive collapse followed destruction of the phrenic nerves in rabbits, all other attempts to find experimental support for the hypothesis of paralytic origin have yielded absolutely negative results. Crymbles' case (No. 15) in which, after paralysis of all the intercostal muscles and the right side of the diaphragm, the aeration of the lungs was perfectly maintained by the left diaphragm alone adds further confirmation to the experimental evidence. Indeed, all the signs of massive collapse—i.e., retraction of the chest wall and displacement of the mediastinum—testify eloquently to an increase in negative pressure on the affected side which could hardly be brought about by paralysis of the very mechanism which, when it is functioning normally, helps to maintain that pressure.

Similarly, save for an experiment in which Carlson[23] produced contractions and expansion of an extremely rudimentary lung of amphibians by stimulating the intestine and peripheral nerves, there is complete lack of corroboration for the reflex factor suggested in the theories of Bradford, Scott, Scrimger, and Sante.

We ourselves are convinced that the one determining cause is obstruction of the bronchial tree. Our opinion is endorsed by the fact that, long before collapse was recognised as a clinical entity, Mendlesohn,[24] Traube,[25] and Lictheim[26] could always produce collapse of the lung by obstructing the bronchi, and that much more recently their findings have been thoroughly substantiated by Coryllos and Birnbaum. Experimentally it is quite certain that the complete occlusion of a bronchus is always followed by collapse of the lung supplied by that bronchus, because the entrapped air is absorbed by the blood. Nor is there any lack of clinical evidence in support of this theory, for many cases have been reported in which the lung collapsed because of definite obstruction of the bronchi by the foreign body, tuberculous mass, or neoplasm. In post-operative cases Jackson and Lee, Hearn and Clerf, and Harrington[27] have been able to watch the very rapid re-expansion of the lung which followed bronchoscopic removal of thick secretions.

Predisposing Causes in Post-operative Cases.

First among these is the hypersecretion caused by the administration of a general anæsthetic, or the hypersecretion of the pulmonary or cardiac condition which contra-indicated an anæsthetic. This hypersecretion is more marked in males than in females, possibly because the respiratory passages of the former are in a constant state of mild irritation from smoking. This fact may play some part in the relatively high incidence of complications in men. Secondly, the position in which abdominal patients are usually nursed tends to the gravitation of these secretions into the bronchi of the lower lobes, which are alone affected by massive collapse except when one whole lung is involved. The third predisposing cause is interference with the expulsive mechanism either by voluntary suppression or by the excessive use of morphia. In either case the cough reflex, which has been aptly called by Jackson "the watch dog of the lungs," ceases to be excited and secretions accumulate. An incision in the upper part of the abdomen undoubtedly causes more voluntary suppression than one lower down, and this probably accounts for the high incidence of complications after upper incisions. The fact that women are costal rather than abdominal breathers and probably use the costal musculature in expulsion may be a still further explanation of the smaller incidence in the female.

An important question is how much deflation can be brought about by posture and by voluntary inhibition of the respiratory movements. Briscoe, and more recently his pupil,[29] Livingstone, have demonstrated that the supine position is associated with a very marked reduction in the vital capacity of the chest, an alteration which, of course, occurs in all patients recovering from operations.

When massive collapse follows a grid-iron incision or one in the lower part of the abdomen, the initial obstruction not infrequently affects the larger bronchi and, because of the small amount of deflation already present, there is a considerable amount of volume to be made up when the air is absorbed, so that the cardiac displacement tends to be extreme. With upper abdominal incisions obstructions of the larger bronchi occur with equal frequency, but because of the excessive deflation which accompanies these incisions the minute bronchioles very readily become obstructed. This causes a diffuse lobular collapse which gives to the X ray picture of the affected lobe a mottled appearance. It is possible that a lobar collapse would result from the coalescence of these lobular areas, but this is more probably due to a gradual filling of the lower lobe bronchi with the secretions which accumulate when there is no longer a head of air to expel them nor tidal air to evaporate them. Once the lower lobe is completely collapsed the upper lobe can fill the diminished pleural space without causing any displacement of the mediastinum or heart.

This theory depends to a certain extent on the results of certain attempts which we have made at prophylactic treatment, to which we shall refer to later.

Clinical Features.

The symptoms associated with the onset of massive collapse vary very widely, and cases may be described according to their severity as fulminant, moderate, or latent.

In *fulminant* or acute cases the onset is accompanied by a "collapse attack" which, although rare, is striking enough to deserve a description. A patient who may seem fairly well suddenly becomes so cyanosed, distressed, and dyspnœic that death appears imminent. At the same time his temperature and pulse-rate become very high and diaphoresis is generally profuse. At the zenith of the attack the patient adopts a very characteristic attitude, curving his body and inclining his head towards the affected side. A collapse attack does not necessarily indicate that an unusually large area is involved. We have seen it both with and without mediastinal displacement, and the subsequent course does not differ in any way from that of others.

In *moderate* cases the dyspnœa and distress are very variable but always fall far short of the urgency of a collapse attack. The lips are usually cyanosed, the temperature about 100° F., and the pulse-rate about 120. Diaphoresis is usually present.

The *latent* cases, however, show no symptoms at all, and the explanation of a temperature of 100° F. and a pulse-rate of 120 associated with slight cyanosis must always be sought at the bases of the lung.

In his review of the cases in the literature of 1927, Scott found that in 50 per cent. the onset occurred within 24 hours of operation, in 20 per cent. after 48 hours, and the remaining 30 per cent. in the intervening period. It is fairly certain, however, that in the cases described as coming on after the lapse of 48 hours it is the recognition and not the collapse that is delayed. When the access of air to the alveolar tissue of the lung is interrupted the carbon dioxide in the entrapped air is absorbed very rapidly, and is immediately followed by the oxygen. The nitrogen, however, is not fully removed for 24 hours, so that when the lung is completely airless the obstruction has already been in existence for many hours, and in some cases it seems to become established even before the effects of the anæsthetic have completely worn off.

If a typical case of massive collapse of the lungs—say that of the right lower lobe with moderate symptoms—is seen 14 hours after operation, the temperature and pulse-rate are rising, the respirations are shallow and difficult but only slightly increased in rate, and the skin is moist. The patient may want to cough, but refrains as much as possible because of the pain. At this stage the lower part of the chest is moving very little, if at all, with respiration and the immobility is especially well marked on the right side. The heart is either normally placed or displaced to the right, or else no estimate can be formed of its position. The only physical signs in front are coarse râles heard everywhere with inspiration, but the percussion note in the back, although not absolutely dull, has lost its resonance to a degree greater than that caused by mere postural deflation. The breath sounds can be heard only on deep inspiration, and the vocal fremitus and resonance are much diminished. Moist sounds are conspicuous all over the lungs and X ray examination reveals the mottled appearance of lobular collapse in the affected lobe. Some 20 hours later the acute symptoms have almost completely subsided, but the cyanosis remains and the temperature and pulse are nearing their maximum, which, unless the condition has completely resolved, they attain about 48 hours after the operation. At this time all moist sounds have disappeared from the normal area, but the retraction, immobility, and cardiac displacement are much more marked, especially when the patient lies flat on his back. The physical signs of fully developed massive collapse are present at the right base posteriorly over a small triangle which is bounded roughly by a line passing from the sixth dorsal spine to the point where the posterior axillary fold intersects the base line.

These physical signs present an ensemble which is well expressed in the term "dead lung." The percussion note is as dull as that caused by fluid and has a very similar feel, the breath sounds are entirely absent or are heard only on the deepest inspiration, and the vocal fremitus and resonance are greatly diminished. On the fourth or fifth day the temperature and pulse-rate may return to normal, and between the third and sixth days the cough, which gradually becomes more confident, produces large quantities of thick, green, muco-purulent sputum which contains many polymorphonuclear leucocytes and presents a very variable flora. Pneumococci, *Micrococcus catarrhalis*, and *Bacillus influenzæ* were the most constant in our series. The physical signs, however, are unaltered until some time after the cough has expelled the obstructing secretions, and then they take on protean characters. Occasionally the percussion note becomes resonant at once and the breath sounds vesicular but accompanied by showers of inspiratory crepitation; loud tubular breath sounds may appear with increased vocal fremitus, bronchophony and pectoriloquy, and any intermediate condition may be discovered. Not uncommonly the physical signs have a patchy distribution, presenting one set of characteristics in one place and another elsewhere. These signs may persist for many days after the obstruction is removed and the patient appears perfectly well, but the rapidity with which the lung becomes reaerated clinically and radiologically bears a very definite relationship to the duration of the obstruction as judged by the physical signs. The obstruction is usually removed before the fifth day, after which the signs of massive collapse give place to those of its complications.

Cases 1 and 2 of our series show the most rapid recovery possible: reinflation after early removal of the obstruction brought about by turning the patient very violently on to his affected side. The sputum of Case 2 gave at one stage definite evidence of the breaking-down of the lung parenchyma, and we believe that if postural drainage had not been persistently maintained this case might have had a much less favourable issue. The majority of cases, however, ran an intermediate course.

Complications and Mortality.

Collapse, although itself of interest rather than import, may become a matter of gravity because of the complications to which the collapsed lung is liable. Experimentally these inflammatory complications have been studied in dogs by Coryllos and Birnbaum. Their general conclusion was that some degree of inflammatory change seemed inevitable if the obstruction remained unrelieved for 72 hours. After this time the most frequent complication was diffuse suppuration—a real purulent pulmonitis which evidently originated from the bronchi. Less often they found a hæmorrhagic pulmonitis resembling that of influenza, or a typical broncho-pneumonia, but never lobar pneumonia. It seems likely that the violent infective changes in dogs are related to the presence of *Bacillus coli* in the mouth, but in man the muco-purulent sputum which is nearly always present in the later stages suggests that some infection does occur, and the physical signs indicate changes in the lung varying from mere congestion to broncho-pneumonia. Scott, Lee, Pasteur, Elwyn[32] and Hirschbroeck[33] all report cases in which the secondary broncho-pneumonic condition was accompanied by severe toxæmia and ended fatally, but this is rare. A thick fibrinous exudate, however, is not uncommonly found over the collapsed area post mortem. This may be secondary to the inflammatory conditions, but in the two patients in whom it came under our notice it originated from the rupture of a subpleural abscess which was in communication with the bronchial tree.

Massive collapse and its complications are probably not attended with any estimable mortality. The cases in which the resulting broncho-pneumonia proved fatal form a very small percentage, and although four of the cases in our series came to autopsy there was always some cause of death other than the pulmonary condition.

Pathology.

It seems that a true uncomplicated case has never yet come to autopsy. Microscopically the collapsed lobe is usually found as a shrunken mass crowded up against the vertebral column by the emphysematous lobe which is not affected. It is purple-red, firm, and quite airless, so that it sinks in water, and the unaffected lungs are usually emphysematous. In the areas where the inflammatory changes are not so severe as to overshadow everything else, the alveolar spaces are greatly diminished in size and the cells, although their outline remains clear, become crowded together. Because of this approximation of the alveolar walls the lung assumes such an extremely vascular appearance that Jackson and Lee speak of an angiomatous condition. The most common indication of the inflammatory changes is the filling of the smaller bronchi by fibro-purulent plugs and the presence around them of areas which are indistinguishable from broncho-pneumonia. Differences occur in the extent of these changes, but no other inflammatory condition is described.

Four of the patients in our series died and were submitted to post-mortem examination; none of them had shown cardiac displacement before death.

In the first death was due to a large empyema on the side of the massive collapse, originating from the retroperitoneal spread of an appendix abscess. The second died, seven days after the establishment of massive collapse, from streptococcal peritonitis; the right lower lobe was shrunken, firm, and airless with pus in all the small bronchi. In the third death from peritonitis occurred seven weeks after operation; during most of this time the physical signs had suggested an effusion at the left base. The lower lobe on the left side and the lower part of the upper lobe were covered with a thick fibrinous exudate, under which the lower lobe was shrunken and airless to a degree far in excess of that which could be caused by mechanical pressure. This exudate was caused by perforation of the collapsed lung over an abscess cavity about as large as a walnut in the lower part; the cavity was proved by the injection of lipiodol to be in communication with the terminal bronchus. The fourth patient died, six weeks after operation, from infective endocarditis which apparently followed an infection of the throat during convalescence. Macroscopically the appearances were almost identical with those in the previous case, the lower lobe on the left side being contracted to less than one half of the original size and covered with a layer of fibrin resulting from the rupture of a bronchiectatic abscess three days before death.

The sections in these cases had very little in common. In the second case, although the collapse had been present for only seven days, and in the third, where it had persisted for seven weeks, the inflammatory changes were well marked and, but for the macroscopic evidence of collapse, it would have been difficult to differentiate the condition from broncho-pneumonia. There were, however, areas in which the angiomatous condition described by Jackson and Lee was vividly portrayed, and others in which the alveoli were occupied by fibrinous exudate which contained practically no cells and presented an appearance strikingly similar to the descriptions given by Coryllos and Birnbaum of one type of pulmonary complications of bronchial obstruction. The sections of the fourth case, although the collapse had persisted for six weeks, showed very much less inflammatory reaction, apart from the ruptured bronchiectatic abscess. There were a few patches resembling broncho-pneumonia and others in which there was a fibrinous exudate only, but the general appearances were those of simple massive collapse with approximation of the alveolar walls and dilatation of the capillaries.

It seems, therefore, that, although the microscopic appearance of uncomplicated massive collapse is fairly characteristic, it may be completely overshadowed by secondary inflammatory changes, and that in these circumstances due attention must be given to the macroscopic shrinkage and to the absolute airlessness of the affected lung.

Diagnosis.

Pneumonia may be justly suspected in most cases when bronchial breathing and pectoriloquy are present, but when these signs occur in a patient who

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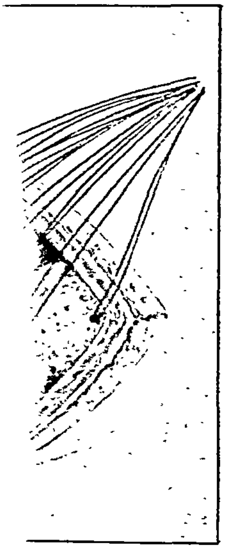

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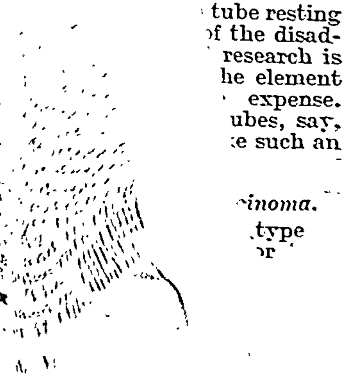

massive collapse. Attempts should be made to increase the aeration of the lungs by forced breathing or the administration of carbon dioxide to produce hyperpnœa, although we are somewhat sceptical of the value of this latter treatment.

Conclusions and Summary.

1. 13·7 per cent. of all abdominal operations are followed by pulmonary complications, males being more affected than females, and upper abdominal operations more than lower.
2. Pneumonia occurring after abdominal operation is extremely rare and all these complications consist of massive collapse of the lungs, which may or may not be accompanied by the cardiac displacement on which Pasteur laid such stress.
3. Massive collapse is due to obstruction of the lumen of the bronchi, followed by absorption of the contained air by the blood stream. This obstruction most often affects the larger tubes, but when the incision has been in the upper abdomen the deflation of the lower lobe is so great that the bronchioles may become primarily obstructed.
4. About one out of every six of these cases exhibits cardiac displacement, depending on the degree of deflation of the lung before the obstruction occurred.
5. The predisposing causes are the catarrh which follows an anæsthetic, the position in which the patients are nursed, and the inhibition of the cough reflex by pain or the excessive use of morphia.
6. The clinical features, complications, pathology and diagnosis of massive collapse are described.
7. Certain measures of treatment are advised, with special reference to postural drainage.

We are indebted to the honorary staff of the Ancoats Hospital whose cases form the material of this investigation; and to Mr. P. G. McEvedy, F.R.C.S., Dr. E. W. Twining, and Dr. A. E. Barclay for much helpful advice and criticism of our efforts. For the bacteriological and pathological investigations our thanks are due to Dr. Mary Leslie Smith.

[*Note.*—A complete table of the cases investigated has been prepared and may be inspected on application to the authors.

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OBSERVATIONS ON THE RADIUM TREATMENT OF VESICAL CARCINOMA.*

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(*With Illustrative Plate.*)

FIFTEEN years ago the study of radium therapy in this country was in its infancy, the medical profession, with few exceptions, having no knowledge of the results which had already been obtained on the Continent. Even America, so responsive to all that is new in therapeutics, had likewise lagged behind. To N. S. Finzi must be given the credit of being the first in Great Britain to use radium in any large quantity for the treatment of malignant disease. The lack of interest shown by the hospital authorities was remarkable, and it was not until the news of the disappearance of tumours, when exposed to radium irradiation, had filtered through to the general public that they were stirred from their lethargy. Then came the reaction and the demand for the rare and expensive element became an urgent problem. There followed the usual attempts of imposters to sell metal tubes which were stated to contain radium. I recall two instances, one in which a tube supposed to contain 20 mg. of the salt proved to be empty, and the other, in which the brother of a medical man, suffering from carcinoma of the stomach, had been persuaded to take, by the mouth, radium in solution, at the price of 10*s.* 6*d.* per bottle. How many bottles he purchased I know not, but the one that came into my possession contained only a coloured fluid.

My acquaintance, in 1913, with certain workers in Paris, such as Degrais, Domenici, and Becquerel, caused me to make a special study of the changes which occur in malignant tumours on exposure to radium. The findings from this investigation were incorporated in a paper read before the Section of Pathology of the Royal Society of Medicine in the spring of 1914. They entirely confirmed the work of Domenici and may be summarised as follows:—

1. The greatest effect upon a tumour when exposed to irradiation is produced by burying the tube containing radium in its substance.
2. Unless the malignant cell is destroyed at the first exposure its power of resistance is increased with each succeeding one.
3. Different types of malignant cells differ in their degrees of sensibility to irradiation.
4. The nucleus is the first part of the malignant cell to show changes.
5. The action of radium on the connective tissue cells is similar to the attempt of nature to arrest the growth of cancer through overgrowth of fibrous tissue.

The most important advance since this date in our knowledge of the changes in cells, both normal and malignant, is that made by Dr. Ronald Canti with his cinematograph. He has demonstrated that the fibroblast is not destroyed by a comparatively large dose of radium, whereas certain other normal cells are. This is a very valuable observation when we consider the relationship of these normal cells to the inhibition of the growth of malignant disease in the human body. The clinician well knows the atrophic scirrhus, and the pathologist is well aware why it is atrophic. The overgrowth of fibrous tissue in and around the tumour has terminated once and for all the activities of these malignant cells.

A. H. Drew, of the Imperial Cancer Research Fund, carried out a number of experiments upon the growth of cells outside the body, and demonstrated that a malignant tumour will take on disorderly growth in the absence of fibroblasts. If the latter cells be added to the culture of carcinomatous tissue, the spread of the mass is immediately restrained. In other words, the fibroblast is the constable of the cancer cell. The data thus collected must have an important bearing on our endeavours to eradicate cancer with the aid of radium. Even though the malignant mass cannot be caused to disappear—the ideal at which all of us aim—we know now that it is possible to reduce it to impotence by bringing the fibroblast to our aid. Radium not only fails to have a lethal effect on this connective tissue cell but, under certain conditions, seems to stimulate its reproductive powers.

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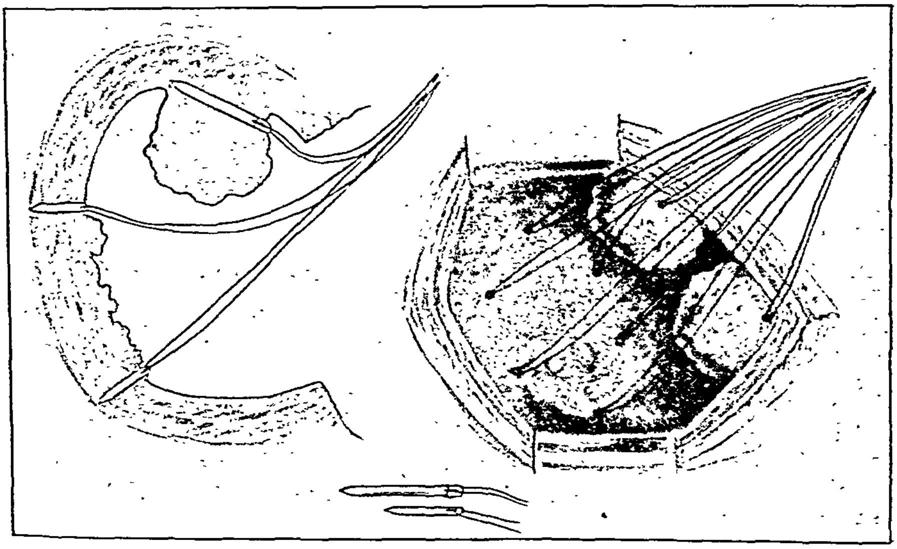
* Being a paper read before the Section of Urology of the Royal Society of Medicine, May 24th, 1928.

It is with these facts before me that I have elaborated a technique for the radium treatment of vesical carcinoma. To place one or more tubes in a haphazard way into a portion of a bladder growth, irrespective of its anatomical position and its degree of activity, is a common mistake which has brought discredit on the value of radium as a therapeutic agent. Its application cannot be carried out by any rule of thumb. The growth must be carefully defined, not only from within the bladder but also from without. The relationship of adjacent structures, such as the ureter, rectum, and large blood-vessels, should be noted and, finally, an attempt may have to be made to sweep away that most serious of all cancer complications — sepsis — before treatment is commenced. Care has to be taken that the ureter is not constricted by the overgrowth of fibrous tissue resulting from excessive irradiation in its vicinity. The same applies to the iliac vessels, in which also, on account of the sensitiveness of the lining endothelium, thrombosis is a possible complication. I have seen death take place three days after the application of a tube containing 92 mg. to within 5 mm. of the inferior vena cava. Thrombosis had extended along a considerable part of this vessel.

Operative Technique.

Access to the tumour is obtained either through the urethra or by a suprapubic cystotomy. For the transurethral application of radium an operating cystoscope is required to allow of the accurate insertion of the container into the substance of the growth. The cystoscope is then withdrawn and the radium, attached by a holder, is left in position for as long as the surgeon considers necessary. Obviously treatment with the aid of the cystoscope has its limitations, although some authorities insist that access through the urethra is the route of choice. The treatment of any bladder disease with the help of the cystoscope requires not only a well-developed visual sense, but also plenty of common sense. Is it conceivable that even the expert cystoscopist can determine accurately the extent of a cancer? When hæmorrhage or infection is severe, he will get but a glimpse of the tumour, and, moreover, the size of a tumour as seen on the mucous surface of the bladder is no guide to its depth and the width of invasion of the muscle layers. The only advantages of transurethral application are that the patient requires no anæsthetic and no incision through the bladder wall. As already stated, it is essential to define accurately the limits of the growth, and this can only be done by a suprapubic cystotomy. Under anæsthesia, either general or regional, a catheter is passed by the assistant and the bladder is washed out with an antiseptic fluid—it is my custom to use 1 in 8000 oxycyanide of mercury—and then distended. The catheter is withdrawn and the urethra compressed by a penile clamp. With the patient in the Trendelenburg position, the bladder wall is exposed, emptied of its fluid contents by trochar and cannula, incised, and retractors inserted. This allows of a thorough inspection by sight and touch of the mucous surface of the tumour. It is important to note whether the growth is of the ulcerative type or that known as the papillary carcinoma, for the method of application of the radium tubes is different in the two cases. The retractors must now be withdrawn and the fingers of one hand passed between the outside of the bladder wall and the bony pelvis, the fingers of the other hand being in contact with the lesion on its mucous surface. Such bimanual palpation will indicate the exact position of the tumour in relation to ureter, rectum, iliac vessels, and obturator nerve, also the extent of infiltration of the vesical musculature and the pelvic cellular tissue. Having determined thus the precise anatomy of the cancer and its clinical variety, careful consideration must be given to the position of insertion of each tube of radium.

FIG. 1.



Sketches to illustrate the methods of inserting radium tubes in (a) papillary carcinoma; (b) ulcerative variety of carcinoma.

Before discussing this part of the technique it is necessary to refer to the quantity of radium and the containers which have been placed at the disposal of the staff of St. Peter's Hospital by the British Empire Cancer Campaign. The total amount of radium is 200 mg. This is put up in platinum tubes, each 0·5 mm. thick, and varying in size according to the contents. There are ten tubes containing 10 mg., one tube of 50 mg., and two tubes of 25 mg. All the alpha rays, and the large majority of the beta, are cut off by the 0·5 mm. of platinum, and for all practical purposes we use nothing but gamma radiation. The radium is kept in a safe, each tube resting in a slot drilled in a mass of lead. One of the disadvantages in the use of radium in clinical research is the inability to alter the distribution of the element in the containers without considerable expense. There are times when one desires to use tubes, say, containing 5 mg. each or even less. To make such an alteration may cost £60 or £70.

Insertion of Radium Tubes in Bladder Carcinoma.

The papillary carcinoma, the cauliflower type of growth, has a pedicle which may be thick or thin, and which consists of malignant cells and vessels going to supply the main mass with blood. In such a case, insert the tubes—the amount depending on the size of the tumour—right through the pedicle, as shown in Fig. 1. The tube is left in position for 24 hours, thus ensuring destruction of the main blood-vessels and setting up an extensive fibrosis in the wall of the bladder adjacent to the tube. The latter is pushed into position by means of a special holder. The free end is threaded with silkworm-gut and the latter brought out of the bladder through the suprapubic opening and stitched to the skin. The anterior bladder wall is sewn up, except for a small opening to admit a drain and allow the silkworm-gut and radium tube to be removed without difficulty at the end of 24 hours. The drain is left in for another 24 hours.

For the ulcerative type of carcinoma the technique is modified in two respects. The centre of the tumour consists of old cells, some of which are undergoing degeneration. It is unnecessary to attack these cells, for they are suffering from senility and are therefore harmless. The cells at the margin of the growth, on the other hand, are young and in active division. The radium must therefore be concentrated at this point and in sufficient dose not only to destroy these cells but to produce a ring of fibrosis beyond the growing edge. The tubes, then, are inserted into the wall of the bladder (see Fig. 2) at the edge of the ulcer, and at sufficient distance from one another to ensure that the intervening space is bombarded with a lethal dose. Herein lies our greatest difficulty in radium therapy. That which is a lethal dose for the cancer of one patient is not necessarily lethal for the cancer of another. Until we are able by some means to determine the degree of sensitiveness of each individual's cells treatment must remain empirical. The further modification in technique consists in attacking the tumour from outside the bladder. Tubes must be buried in the cellulo-fatty tissue which is situated around the ureter and iliac vessels. They are threaded with silkworm-gut like those within the bladder, and are brought out on to the surface of the skin through the same suprapubic opening.

Radium Combined with Fixatives.

Of recent years attempts have been made to destroy cancer cells by injection into the blood stream of certain chemical substances, more particularly heavy metals in colloidal solution, colloidal selenium, and colloidal lead. So toxic, however, are these solutions that, with experience of them, it becomes increasingly difficult to believe that, to use a racing expression, they will "stay the course." On the other hand, it is conceivable that if used as activators in conjunction with radium—in other words, for the purpose of giving off secondary radiations—they may play an important part in a sustained attack upon a malignant tumour. Mottram, of the Radium Institute, has already published the results of experiments conducted with lead on these lines. If a substance is used which is fixed in the malignant cell and which, unlike lead, is non-toxic, our chances of success are improved. I believe it was Wassermann who first demonstrated that the coal-tar product eosin could become fixed in a carcinoma cell. A short time ago I was much impressed with the results of treatment of a case of carcinoma of the male breast by the injection of sodium fluorescin, followed by an X ray exposure. The investigator was Dr. Monckton Copeman. Fluorescin is a derivative of eosin, is non-toxic, is fixed in the carcinoma cell, and will give off secondary radiations. Profiting by the experience of Dr. Copeman, I injected a malignant growth of the bladder with a 2 per cent. solution of sodium fluorescin and at the same time inserted a number of tubes of radium. The result has been encouraging. It is only one case, and is therefore, from a scientific standpoint, of little importance unless the experiments are repeated over and over again.

Prognosis.

It is a striking fact, confirmed by numerous observers, that bad results are to be expected from radium irradiation where sepsis has intervened upon a malignant growth. I know of no exception to this rule. It is worse than useless in the case of vesical carcinoma. Every effort must be made with the aid of lavage to reduce the infection to a minimum. In a foul-smelling cystitis there is no better disinfectant than a weak solution of sanitas, ʒi. to the pint. Prognosis is far from hopeful, even when some success attends the attempts to eradicate sepsis.

What, then, can be regarded as a favourable factor, apart from the size of the tumour and the type of cell? It is hæmorrhage. Patients utterly exhausted from excessive bleeding and in imminent danger of losing their lives from this complication alone may be restored to a state of health which allows a breathing space for further efforts to control the disease. In severely bleeding growths, if the dosage and technique advocated in this paper be adopted—namely, a large quantity of radium with a short exposure—hæmorrhage will cease within 24 hours of the commencement of irradiation and in some cases within four hours; the suprapubic wound will heal rapidly; the general condition will steadily improve, and discharge from hospital may be expected within three weeks from the onset of treatment.

This may be termed the immediate result of radium irradiation. The remote results are as follows. In favourable cases the general condition of the patient is good, as judged by the increase in weight. Even though the urine may be quite clear, there is frequency of micturition, due to radium reaction in the mucous membrane, and slight discomfort on defæcation resulting from irritation of the rectal mucous membrane. Cystoscopy shows, at the end of three months, a curious bullous œdema of the area of mucous membrane irradiated. In other cases, more particularly the ulcerating variety and when the tumour is of large size, a mass of dead growth surrounded by a raised edge, covered by what looks like normal mucous membrane, is observed.

It is common knowledge that healing of tissues after exposure to radium irradiation may be slow. With the exception of a case treated in 1925, the reverse has happened in my cases. This is entirely due to the use of comparatively large quantities of radium with an exposure of not more than 24 hours. The report of the Medical Research Council for 1926 on the medical uses of radium records the result of the treatment of rectal cancer by 20–48 mg. of the element, left in situ for periods up to 10 days. Delay in the healing of the wounds was a noticeable feature in all cases. There is also, I submit, a grave danger of sloughing of normal tissues.

Attention has been drawn, in my article published in the *British Journal of Radiology*, to the method of dealing with the ureter, when constricted by growth, by transplanting it into a growth-free part of the bladder. With further experience I wonder whether this is necessary, provided no radium fibrosis is produced around the duct. A reference to the notes of my cases tends to support the view that relief of pressure will probably result from the absorption of dead carcinomatous tissue. Stress must be laid upon the experimental nature of the work which has been undertaken on cases treated at St. Peter's Hospital. The radium has been applied for the most part to patients already exhausted by complications and the failures of operations or diathermy. The disease has come under treatment in the inoperable stage, and in one or two cases the cancerous cachexia has been profound.

Of 12 cases treated since 1925, four have been complete failures. Of the remaining eight, one was first treated 2½ years ago. He was a man of 64 with a large ulcerative growth of the right lateral wall, spreading to the internal meatus. Repeated applications of diathermy merely seemed to increase the hæmorrhage. On admission he was collapsed from the excessive bleeding and blood transfusion had to be resorted to. The bladder was then opened and half the growth excised, the remainder being surrounded by tubes of 10 mg. of radium left in situ for 24 hours. The patient was discharged 21 days later with a healed wound and passing a clear urine. For two years he enjoyed good health, but in January of this year there was a recurrence of hæmorrhage. Cystoscopy showed a growth involving trigone and both lateral walls. 110 mg. were implanted into the growth for 24 hours, and he was discharged 21 days later with the wound healed but with cloudy urine. In March, 1928, cystoscopy showed dead growth on the right lateral wall and right half of the base of the bladder, but no hæmaturia.

Three cases treated about a year ago are alive and in fair health. One had been attending the genito-urinary department of a general hospital for three years on account of hæmorrhage, and had had numerous applications of diathermy. The growth involved the whole of the left lateral wall, including the left ureteric orifice. 200 mg. of radium were inserted for 24 hours, and he was discharged 22 days after operation with the wound healed and clear urine. This patient has put on more than one stone in weight. On March 31st cystoscopy showed a slough on the left lateral wall, with rolled-over edge. The bladder capacity is normal. There has been no hæmaturia but the urine contains a small quantity of pus.

The second case is a partial failure, in that the patient has suffered severely from radium reaction. There was much hæmaturia on admission which diathermy failed to control. 110 mg. of radium were inserted into the growth, which occupied the whole of the left lateral wall and was covered by slough and phosphates. The tubes were removed at the end of 24 hours. In March, 1928, cystoscopy showed no visible growth, but cystitis was present and the bladder was very irritable to distension. There was also rectal tenesmus and tenderness of the mucous membrane on digital examination.

The third case was a man of 63, who had been operated upon previously and treated by open diathermy for a growth of the left lateral wall. When the bladder was opened for the second time on account of hæmorrhage it was found that there was an ulcerative growth involving the left half of the internal urinary meatus and the major part of the left lateral wall. 180 mg. of radium were implanted around the margins of the growth and left in for 24 hours. The patient was discharged from hospital 21 days after operation, with the wound healed and slightly clouded urine, but no blood. On April 28th I cystoscoped this patient and found no growth, but bullous œdema of the left half of the internal meatus. His general condition was good and his weight had increased. The urine contained a small quantity of pus. He complained of irritation in the anus.

The remaining cases, four in number, have been treated within the past six months. The disease in all was in an advanced stage. Two of them have had their bladders opened at least twice for open diathermy. When I inserted radium tubes the prominent symptom had been continuous hæmorrhage. Within 24 hours in each case hæmorrhage ceased. The four of them, one a woman, are alive and in fair health.

Conclusion.

As a result of observations extending over a number of years, certain definite statements can be made. Firstly, vesical carcinoma, in our present state of knowledge, cannot be cured by radium irradiation, but a shrinkage of the tumour, even to apparent disappearance, may be expected. Secondly, severe hæmorrhage can be controlled, and therefore an improvement in the general state of health will follow.

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Clinical and Laboratory Notes.

TETANUS TREATED BY INTRACISTERNAL INJECTION OF ANTITETANIC SERUM.

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In 1921 I published in The Lancet (i., 1356) a case of tetanus treated with large doses of antitetanic serum. That case was not more severe, but the period of treatment was longer than in the one here recorded. The serum in the earlier case was given intrathecally. In the present case, owing to lack of progress during intrathecal administration, the intracisternal route was used on the fifth day with almost immediate lessening of the rigidity of the jaws. The total quantity of serum used was less, being 192,000 units, as against 236,500 units given to the first patient.

A horseman, aged 21, a well-built, healthy looking man, was admitted to Hull Royal Infirmary on Feb. 22nd for stiffness of the jaws. On Feb. 19th he had noticed his jaws were stiff and thought he had neuralgia. On admission the masseter muscles were firmly contracted and he could only open his mouth a little, the greatest distance between the incisors being 0·75 cm. He complained of stiffness of the jaws, the back muscles (especially between the shoulders), both legs, especially the left, and the abdominal muscles, which were so rigid that the movements of the diaphragm were impeded. This may have been due partly to the rigidity of the diaphragm itself, as later some bronchitis developed. The source of infection was evidently a sore on the left heel, which was red and tender: the left leg was much stiffer than the right. He had other cuts on his hands and legs. These were all treated with tinctura iodi and other antiseptics. The pulse-rate was 100, the temperature 99° F., and the blood pressure 82 115. Heart, lungs, and urine showed nothing abnormal. The knee-jerks were both exaggerated and ankle-clonus was present in both feet. There was no Babinski sign. There was incoördination of both hands and slight pallor of the optic discs.

He was given large doses of antitetanic serum of high potency intrathecally, intramuscularly, and subcutaneously, for five days.

On Feb. 22nd the cerebro-spinal fluid was under increased pressure. He was put on four pints of milk in the 24 hours. On the 23rd, at 3 A.M., grs. 20 of chloral and grs. 30 of potassium bromide were given, as he was unable to sleep and complained of headache and pain in the back of the neck and between the shoulders. He had a bad night. His diet was increased by adding three eggs and 2 oz. of sugar of milk per diem, with water ad lib. to dilute the toxin. A rectal wash-out was given. The sores were treated with tinct. iod. three times daily. On the 24th rhonchi were present in the chest, owing probably to the rigidity of the diaphragm and the recti abdominis, so he was put on a mixture of ammon. carb. and vin. ipecac. His teeth were frequently attended to. Lemonade and Valentine's meat juice, one drachm in water every four hours, were given. On the 25th his pulse became weak and irregular. Natibaine ♏ 15 was given three times a day. At the same time he developed a severe attack of herpes labialis, which caused him considerable discomfort. This cleared up fairly soon with an ointment of hydr. ammon. chlor., grs. 10, ung. boric, drs. 2, ung. zinc, drs. 6. The abdomen was still very rigid, but the legs moved more freely. The rigidity of the jaws continued, and with the greatest effort he could not open his mouth more than 0·5 cm. He had no headache and was taking well five pints of milk and five eggs daily, with water, lemonade, and Valentine's meat juice, one drachm four-hourly. A third of a grain of morphine was given at night.

On Feb. 27th, as the spasm of the masseters continued and the mouth could be opened only 0·5 cm. with much difficulty, 10,000 units of serum were given intracisternally under local anæsthesia, 1 c.cm. of 2 per cent. novocaine being injected into the skin and deep tissues at the back of the neck; 10,000 units of serum were given intramuscularly at the same time. After the intracisternal injection he had some headache all night, but this disappeared in the morning. On the morning of the 28th he stated that he had no headache and said that he "felt grand this morning." Eighteen hours after this injection his mouth could be opened to 0·9 cm. and both the abdomen and legs were less rigid. Later in the day he had slight headache. The optic discs showed slightly blurred outlines. The temperature was 98·4°, the pulse-rate 110; respirations 24.

On Feb. 29th the mouth opened more easily and the herpes had improved. He felt better in himself; his legs moved easily and were not so stiff. The abdomen was less rigid and the breathing was easier, due probably to the diaphragm being less rigid. On March 2nd the diet was increased to bread crumbs and mince. He was able to open his mouth 1 cm. On the 5th his mouth opened 1·1 cm. easily. There was still some rigidity of the abdomen, but no pain. The jaws did not feel so stiff. On the 6th the legs were less rigid, but the left was still more rigid than the right. The abdominal rigidity, although less than on admission, was still quite marked; the back muscles were much softer and felt more comfortable. On the 19th he could open his mouth 2·6 cm., which is about normal for him. There was still some rigidity of the abdominal muscles: otherwise he was in good health. On the 27th the rigidity of the abdominal wall had gone and he felt very well. He was able to do work about the ward. On the 28th he was discharged.

Table of Injections of Antitetanic Serum.

Date, 1928.	Sub-cutaneous.	Intra-muscular.	Intra-thecal.	Intra-cisternal.	Total.
Feb. 22nd ..	—	10,000	20,000	—	30,000
„ 23rd ..	10,000	10,000	20,000	—	70,000
„ 24th ..	10,000	10,000	—	—	90,000
„ 25th ..	—	10,000	10,000	—	110,000
„ 26th ..	10,000	10,000	—	—	130,000
„ 27th ..	—	10,000	—	10,000	150,000
„ 28th ..	10,000	—	—	—	160,000
„ 29th ..	10,000	10,000	—	—	180,000
March 2nd ..	3,000	3,000	—	—	186,000
„ 6th ..	3,000	3,000	—	—	192,000

Pathologist's report on cerebro-spinal fluid.—Wassermann, negative. Cells, less than 1 per c.mm. Protein, 30 mg. per 100 c.cm.

The intracisternal injection seemed to have a more marked effect on the spasm of the jaws than on the other muscles, and the improvement in his general well-being was due to his being able on this account to take more nourishment, as well as to a great reduction in the toxic condition.

Technique of Cistern Puncture.

The cisterna magna lies anterior to the occipito-atlantoid ligament. Fluid is obtained at from 4·5 to 6 cm. depth; in this case it was obtained at 4·5 cm. In another case punctured a week later it was 5·6 cm. before fluid was obtained. The hair is shaved off the head at the back for about two inches. Tinct. iodi is applied and 1 c.cm. of 2 per cent. novocaine is injected in the line where the puncture is to be made. The patient is put on his left side with his head suitably flexed; a dab of tinct. iod. is smeared on the mastoid process in the external auditory meatus and glabella line. The needle, guarded to 5 cm., or more in a big patient, is inserted just above the spine of the axis, which can be felt, and is pushed in until the edge of the foramen magnum can be felt with the point, going very slowly, in order not to blunt the needle. The point is depressed and pushed carefully upward, in order to keep away from the medulla. There is usually about 2·5 cm. between the dura mater and the medulla. The needle should be pushed very slowly after feeling the edge of the foramen magnum, the stylet being frequently taken out to find if fluid is reached.

It is a good plan to rotate the needle, as it helps it to pierce the membranes with less force and thus reduces the risk of injuring the medulla.

When the cerebro-spinal fluid begins to flow 30 cm. or more are withdrawn and replaced by a rather lesser quantity of serum. The head should be kept low, using only one small pillow, and the foot of the bed raised by blocks about 6 inches high.

A CASE OF
RECOVERY FROM AMYLOID DISEASE.

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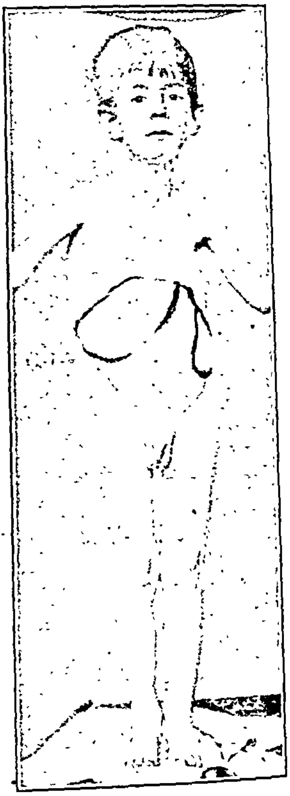
THE object of this account is to describe a case in which serious and advanced amyloid disease regressed completely when the septic focus was treated. Amyloid disease is rarely seen nowadays—regression appears to be outside ordinary clinical experience. Moreover, the case shows in a remarkable way how completely one lung can be thrown out of action without serious prejudice to the patient's vitality and activity.

In January, 1918, the patient, the only child of a widowed mother, and then aged 4, was admitted for a post-pneumonic empyema. Drainage by ordinary intercostal incision was established and the child did well at first. After a little while drainage became inadequate and the boy became a severe invalid with fever and wasting. Against the most urgent advice he was taken from hospital and was lost sight of by us. He was in a critical condition for many weeks; he was unable to move his limbs and had to be wheeled about in a little carriage. Again and again the wound spontaneously healed and reopened. In January, 1919, he reappeared in hospital in desperate straits. The wound was reopened and good drainage established, with marked amelioration in the condition. After some months of fair health fever and wasting returned and obvious septic absorption from a thoracic collection was taking place.

In November, 1919, further drainage by rib resection was effected, and again a marked improvement in general physique was noted. The wound healed and again broke down. A further rib resection was done with careful wound toilet, and the boy was not seen again for several months, during which time he enjoyed fair health. In January, 1920, his health began to fail again, and a serious decline took place. There was fever, wasting, and never-ending wound discharge.



The patient in May, 1920, showing deformity of chest and enlargement of liver and spleen.

By May, 1920, he was very anæmic and extremely wasted; altogether a miserably cachetic specimen. The operation site was an ugly sinus, discharging freely. The fingers were clubbed. The smooth and very considerable enlargement of the liver and the spleen (see figure) together with albuminuria made clear the diagnosis of amyloid disease.

The sinus was reopened and irrigated; there was great improvement in general health and some lessening of the discharge, but again relapse took place.

His condition was now so critical that it was thought hopeless to do anything further. After much doubt, surgical measures were again decided upon, largely on account of the recuperative power which this particular boy had shown in each preceding partial recovery phase. In October, 1920, Mr. J. F. Dobson performed an extensive thoracoplasty in several stages. He removed the posterior portions of the ribs over the wound site, taking a piece out of each rib from the third to the tenth inclusive. Very free drainage was thus provided and the chest wall was allowed to begin its collapse inwards. This collapse, which constituted the essential mode of cure in this patient, took place gradually over a period of 16 months. From February, 1921, to March, 1922, steady drainage and wall collapse were carefully tended at home and firm improvement noted in all ways. Diminution in size of the liver and spleen, with steadily lessening cachexia, was noted as early as May, 1921. In April, 1922, the wound was finally and soundly closed and the chest wall was permanently collapsed. The collapse was so great as to obliterate almost completely the left half of the thoracic cavity. Thereafter he never looked back; he began to grow rapidly and soon attained good health.

In 1926 he was a vivacious, active schoolboy, taking his place among his fellows at work and play. The liver and spleen could not be palpated, nor could any signs whatever of amyloid disease be detected. The left chest was completely stove in and there was a slight compensatory scoliosis, but there was remarkably little postural deformity visible when the boy was clothed in a loose shirt, and there was still less physical disability. No evidence of activity in the left lung could be heard, but the right lung was hypertrophic. In 1928 continued good health and welfare are reported.

I am indebted to Dr. W. H. Maxwell Telling and Mr. J. F. Dobson for permission to record this case.

AN UNUSUAL CASE OF LYMPHOGRANULOMA WITH GENERALISED METASTASES.

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THIS case is worthy of record, as it is rare for lymphogranuloma to develop general metastases and end fatally within a period of three weeks.

The patient, a Hindu male jeweller from Madras, aged 37, was admitted, on August 4th, 1927, into the medical wards of the Sir J. J. Hospital with an out-patient diagnosis of "ascites." The history was as follows:—For two months before admission the patient had suffered from gradual enlargement of the abdomen, swelling of the feet, dyspnœa and cough, especially at night. The complaint started with burning pain in the abdomen which lasted for five days only, and was followed by gradual abdominal enlargement. Fifteen years previously the patient had had gonorrhœa and a "sore" on the penis, and for the last seven years pain in the abdomen on and off, made worse by meals, but relieved about two hours afterwards without any vomiting and without taking more food. The pain was, however, never bad enough to stop him from working, and his general health was quite good all the time. Five years previously he had had for a few months intermittent fever preceded by rigors. There was no history of dysentery. He was usually constipated.

He had drunk about half a bottle of whisky per day for 20 years and used to smoke a number of "bidis" (Indian cigarettes) per day. He had, however, stopped using alcohol and tobacco since the present complaint started. Father and brothers were alive and well; mother had died of "paralysis" eight years previously.

On admission the patient was wasted, anæmic, and had orthopnœa. Temp., 98° F.; pulse-rate, 112; resp., 35. The abdomen was greatly distended, and there were signs of free fluid in the pelvis and flanks. In the epigastrium a slightly nodular lump was felt. This was dull on percussion, and the dullness was continuous with the liver dullness above and the splenic dullness on the left side. The spleen was palpable three fingers' breadth below the costal margin. The respiratory system, except for a prolonged and harsh inspiratory sound, was normal. Pain in the joints was complained of, but there was no fluid or any other abnormality in any joint. The patient had œdema over both feet, but the cardiovascular and urinary systems were normal. Except for the abdominal pain and some constipation the alimentary system was normal, the patient having a good appetite and good digestion. There was no visible or palpable enlargement of the lymph glands in any part of the body on August 4th, when the patient was first seen, or on the 6th, when the abdomen was tapped and a little blood-stained fluid was withdrawn. Examination of the cellular deposit in this fluid revealed cells resembling epithelial cells, and also a few multi-nucleated cells.

The patient was transferred to the surgical side on August 9th with a view to exploratory operation. For the first time since admission glands in the axillæ and groins were seen to be enlarged. It was decided to tap the abdomen once more before an operation was performed, and this was done on the 15th. No more than a few c.cm. of blood-stained fluid came out. However, the same kind of fluid began to ooze out from the puncture in such large quantities that the dressings were completely soaked and had to be changed every half hour. On the 16th enlarged glands in the neck were first noticed, and there was a rapid increase in the size of the axillary and groin lymph glands. This led to a suspicion of some kind of leukæmia, but blood examination showed the following result:—Red cells: total count, 4,200,000 per c.mm. White cells: total count, 7800 per c.mm. Differential (300): polymorphs, 75 per cent.; lymphocytes, 22 per cent.; eosinophiles, 1 per cent.; basophiles, nil; large hyalines, 2 per cent.; abnormal leucocytes, nil.

On August 18th a lymph gland from the axilla was removed for microscopic examination, and the abdominal puncture, through which blood-stained fluid was oozing out continuously, was closed by a small plastic operation. By this time there were big glandular lumps on both sides of the neck. The patient was going rapidly downhill, and died suddenly on the 21st.

Post-mortem Examination.

Chest: Lungs collapsed, but normal in structure. Blood-stained fluid in the pleural cavities. Mediastinal glands enlarged. Heart and the big vessels normal except for a few atheromatous patches in the aorta.

Abdomen: Blood-stained fluid in the peritoneal cavity. All abdominal lymph glands enlarged. Liver enlarged but otherwise normal in appearance and consistency. No secondary deposits. Stomach and small intestines were normal, but in the large intestine a lump about 2 cm. in diameter was seen attached to the outer wall of the ascending colon, 4 inches above the cæcum. It projected into the lumen, but the mucous membrane was not ulcerated. The rest of the large bowel was normal. Spleen was very much enlarged and adherent to the diaphragm. A large white lump, about 6 cm. in diameter, was attached to the anterior edge and gastric surface. (This was the lump felt in the epigastrium.) Kidneys were normal.

Pieces were taken from the lymph glands, the spleen, and the ascending colon. Prof. V. R. Khanolkar examined them histologically and reported as follows:—"Lymph gland: The normal structure of the gland is entirely obliterated by a uniform tissue which shows extensive proliferation of endothelial cells, lymphoid cells, numerous plasma cells, and eosinophiles. Interspersed in this tissue are found blood capillaries and a varying number of large mononuclear and multinuclear cells with homogeneous cytoplasm and vesicular nuclei, which in multinuclear cells seem to override one another. The stroma is made up of loose connective tissue, rich in fibroblasts. Spleen: The capsule is very much thickened. There is hyperplasia of connective tissue stroma, and the substance is infiltrated by the type of tissue described above in connexion with the lymph gland. Intestine: The distinction between the submucous muscular and subserous coats is lost, and the normal structure is replaced by granulation tissue of the kind described in the lymph gland. The wall of the intestine is thickened (15 mm. in section) as a result of this process.

"Remarks: The tissues show the characters of a lymphogranuloma (Hodgkin's disease)."

This case was interesting from the diagnostic point of view. The history of addiction to alcohol and the ascites suggested cirrhosis of the liver, but the presence of blood-stained fluid and the character of the cellular deposit in it was in favour of malignancy. One of us (B. B. Y.) suspected a primary carcinomatous change in a cirrhotic liver, and the other (S. R. J.) suspected a primary growth of the stomach or the transverse colon, because of the epigastric lump and the long history of abdominal pains. The sudden enlargement of the lymph glands suggested further possibilities, such as generalised tuberculosis (though there was no fever), acute lymphadenoma, acute leukæmia, or a generalised carcinomatosis. The blood picture, however, excluded leukæmias. The diagnosis was really settled by histological investigation after death.

We are indebted to Prof. R. Row and Dr. P. V. Gharpure for the help given during the pathological investigations.

Medical Societies.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.

A MEETING of this Association was held on June 26th, Dr. AMY SHEPPARD presiding.

Dr. LETITIA FAIRFIELD gave an address on

CHILD GUIDANCE.

She said that she had recently had the privilege of studying the methods used in America for dealing with delinquent and difficult children and had been greatly impressed by them. The idea that the chief need of the difficult child was help in adapting itself to its surroundings was not a new one, but the scheme of clinics on a large scale designed to this end dated only from 1908. At this time a group of women in America, of whom the most prominent was a Mrs. Dummer, conceived the idea that the treatment of the juvenile delinquent was unsatisfactory and unscientific. Mrs. Dummer decided to finance a clinic under Dr. W. Healy in Chicago, and he found that if the motives of the child delinquent were studied, it often became apparent that he was not abnormal or psychopathic. Without careful inquiry it was often impossible to tell whether the child or the environment was responsible for the delinquency. From the failure of the child whose bad conduct had brought it into relations with the police, Dr. Healy worked back to those of lesser degrees of maladaptation, and came to the conclusion that the development of faulty habits might be checked and impulses might be trained in the right direction if the child were studied at an earlier stage. Meanwhile, other sociological efforts were being made. Mr. Clifford Beers, who had had an acute attack of insanity in early life and had suffered harsh treatment, resolved to dedicate his life to securing more understanding treatment of the insane. A great society, the National Committee for Mental Hygiene, with branches in all the States, arose from his efforts, and here also it was found necessary to work back to early years in order to find the origin of breakdowns in later life. This work had not proceeded on purely Freudian lines, nor had the child guidance movement developed on psycho-analytical principles, though all modern psychology had absorbed something from Freud's ideas. The psycho-biological theories of which Dr. Adolf Meyer, of the Johns Hopkins Medical School, was the chief exponent, had had much influence on the child guidance movement. This conception of conduct was that it represented the reaction between personality and environment. Myer hardly recognised types of mental disease, only types of individuals reacting to different conditions. He made no sharp distinction between the normal and the abnormal, the sane and the insane. It was on these lines that American social work was developing. Dr. Fairfield proceeded to describe the organisation of the child guidance movement. It involved a preliminary inquiry into the record of the child at school and at home, and into the results of the standardised tests for mental ability. It was surprising how often the cause of the difficulty was that the child was being tried beyond its mental capacity. Sometimes an incorrigible child was merely an overlooked defective. The tests could only be evaluated, however, with reference to the child's emotional reactions. A physical examination was performed on each child and was followed by a careful study of its environment by a " psychiatric " social worker, who was trained on the lines of our C.O.S. workers, but with special instruction in psychology and in the mechanism of behaviour. Dr. Fairfield pointed out that in America less emphasis was laid on material and more on personal factors. If a social worker in this country found that a child lived in a neat house and had good meals, she reported that he had a good home, and if the child did not get on well, the inference was that it was his own wicked little fault. No account was taken of the possibility that the mother might nag at the child or quarrel with her husband, in which case the psychological atmosphere would be that of a bad home. In any home, one spoilt child might call forth revenge reactions on the part of the others. Since all these factors were reported, the American histories were fuller than ours, and this was an advantage. The most important examination of the child was the final one by the trained medical psychiatrist, who had before him the reports of all the other workers. The examination when completed usually gave clear indications for treatment for the child of pre-school age or of school age. Children who failed during the period of parental training of the simpler instincts might develop enuresis, bad habits, temper tantrums, and persistent and serious food fads. In a certain percentage of cases they were very intractable. The education of teacher and parent in their management was being undertaken in association with kindergarten and nursery schools. For children of school age a " visiting " teacher with the training of a psychiatric social worker acted as adviser to the staff on problems of discipline. She also visited the home and reported to the teacher and vice versa, acting as a liaison officer. Since these agencies were available to deal with difficult children, only the really intractable cases needed elaborate study at guidance clinics. These clinics dealt with conduct problems and also with retardation in school work. In America the child who did not advance with his class was considered a disgrace to himself and his teacher. Very often the retardation was not a question of intelligence, but of conduct; in other cases the children were naughty because they were mentally dull and were tried too hard. Dr. Fairfield explained that the guidance clinics were under voluntary bodies such as the Commonwealth Fund, or were run in connexion with the big hospitals. The Commonwealth Fund was a wealthy organisation that had financed nine demonstration clinics, which served also as training centres. They were about to start one in London and were financing it for three years. At the Johns Hopkins Hospital, Dr. Esther Richards was in charge of an excellent clinic under the general direction of Dr. Meyer. The treatment might involve a radical change in the plans for a child's life, and was especially valuable for " dependant " children who were boarded out by voluntary societies in homes that might not be suitable to the individual need without considerable adjustment. The expansion of the movement both for children and adults was remarkable. Charitable societies were beginning to run guidance clinics, also the great department stores. District nursing associations sometimes paid a psychiatric worker to advise the nurses. This expansion proved the value of guidance clinics more conclusively than any statistics.

Discussion.

Dr. **Nina Dobbie** pointed out that in England also many dependant children were boarded out in homes.

Dr. **Alice Hutchison** said that in Leytonstone an admirable clinic was being run, but that throughout this country the work was limited by lack of funds.

Dr. **H. Mackay** asked what number of children could be dealt with at any one clinic. This was relevant to the financial aspect of the work.

Dr. **Fairfield**, in reply, said that the Cleveland Clinic consisted of three doctors, three social workers, and two or three psychologists. That team could deal with 1000 cases in a year.

SOCIETY OF BRITISH NEUROLOGICAL SURGEONS.

The summer meeting of this Society was held in Edinburgh on June 8th and 9th, under the Presidency of Mr. **Wilfred Trotter**, and with a full attendance of members.

On June 8th Mr. **Norman Dott** opened the proceedings by performing an operation, at the Nursing Home at 19, Great King-street, in which he removed an osteoma from the roof of the orbit by means of an osteoplastic craniotomy.—Dr. **Logan Turner** gave an account of his work on " The Paths of Intracranial Infection," demonstrating the meningeal and vascular connexions, particularly those in relation with the nasal passages.—In the afternoon Sir E. **Sharpey-Schafer** related the results of a study of nerve section and regeneration in his own hands. This was followed by a discussion introduced by Dr. H. M. **Traquair** and Dr. A. H. H. **Sinclair** on the Relationships of Ophthalmology to Neurological Surgery, with special reference to visual field defects.—Dr. **Graham** and Mr. **Dott** showed some cases illustrating this subject.—Prof. **Edwin Bramwell** described a case of Intracranial Aneurysm, and showed a specimen.—A dinner was held the same evening at the North British Hotel.

On June 9th a demonstration of Radiograms of the Skull was given by Dr. **Woodburn Morison** and Dr. **Hope Fowler**. Dr. Fowler discussed the Radiotherapy of Intracranial Tumours, some of Mr. Dott's cases thus treated being shown.—Prof. D. P. D. **Wilkie** demonstrated a case of intracranial dermoid cyst, successfully operated on by himself, and a case of acoustic neuroma in which a cerebellar decompression operation had been carried out.—Prof. JOHN FRASER showed a case of injury to the brachial plexus, associated with a fracture of the clavicle by direct violence, and a case of elephantiasis and trophic disturbance of a lower extremity in a child affected by spina bifida.—Mr. W. W. WAGSTAFFE read a paper on the Incidence of Traumatic Epilepsy after Gunshot Wounds of the Head, and gave figures of the frequency of Jacksonian and generalised epilepsy after these injuries.—The meeting concluded with a demonstration of Various Kinds of Cranial Anomalies by Mr. D. M. GREIG, Curator to the Museum of the Royal College of Surgeons of Edinburgh, given in the hall of the College.

OXFORD OPHTHALMOLOGICAL CONGRESS.

THE eighteenth annual meeting, held from Thursday to Saturday, July 5th to 7th, in the department of Human Anatomy of Oxford University, was opened by a short address of welcome from the Master, Mr. Philip H. Adams, Reader in Ophthalmology of the University of Oxford. Dr. Leonard Hill then opened a

Symposium on the Ultra-violet Ray.

He dealt himself with the biologically active rays, their measurement and their penetration of the skin and eye, the theory of the action and immunity to rays, the comparison of sun and lamps as sources, and the action of rays as evidenced by erythema, and touched on hæmo-bactericidal power, rickets, ergosterol, vitamin D, and pigment formation. Some interesting slides of the erythema produced by ultra-violet ray were shown.

Dr. G. M. B. Dobson, F.R.S., spoke next on the effect of atmosphere, the altitude of the sun, and the presence of ozone on the transmission and the energy of ultra-violet rays, illustrating his remarks with curves and photographs.

Dr. W. J. Turrell gave his clinical experiences of the practical administration of ultra-violet rays, emphasising the importance of the regulation of dosage. The lamp he had used for 13 years was the tungsten arc.

Mr. W. R. Ackland dealt with phototherapy in the treatment of dental disease, referring especially to pyorrhœa and its relationship to ocular diseases.

Dr. N. S. Lucas related his experiences of the treatment of rickets in marmoset monkeys by ultra-violet rays, using a mercury-vapour lamp. Reaction was observed in the eyes much more rapidly than in the human subject—i.e., in one to two hours—but passed off more quickly. He considered that some ultra-violet radiation was essential for monkeys in captivity.

Mr. G. O. Hume spoke on the local application of the rays to the eye, emphasising the importance of selection of cases and dosage.

Mr. A. F. MacCallan, whilst recognising the beneficial effect of phototherapy, urged the need for a continued search for causal conditions, notably septic foci in teeth or tonsils.

Demonstrations.

In the afternoon Mr. E. E. Maddox showed an accommodation balance test, a new fixation site for the globe in intracapsular cataract extraction, and an apparatus for training amblyopia in squint on a new principle involving hand and eye.

Mr. Rayner Batten showed a collection of fundus drawings of diseases and anomalies of retinal and choroidal vessels.

Dr. Margaret Dobson showed a test for astigmatism in which the duochrome principle was applied to the Maddox "V" test.

Mr. George Young demonstrated the instruments he now uses in the operation of double sclerotomy for glaucoma which he has devised, and slides in which the effect of the operation could be seen.

Mr. W. Niccol showed slides of a carcinoma of the choroid secondary to carcinoma of the breast.

Mr. B. Cridland exhibited a test-type for children.

Annual Dinner.

At the annual dinner held in the evening in the Hall of Keble College Mr. Adams, who presided, mentioned that 18 new members had been elected during the year, the total membership being now 414, including eight hon. members. The attendance last year was 104, including a number of well-known ophthalmic surgeons from the continent and America. He regretted to have to record the loss since then through death of Prof. Felix Lagrange, a foundation member, Dr. Brownlow Riddell, Dr. W. J. Tyson, Mr. Fredk. Dale, and Mr. T. O'Kelly.

Friday morning opened with a preliminary report by Mr. Burdon Cooper on Spectroscopy of the Crystalline Lens with a lantern demonstration showing the results of the spectroscopic examination of normal and cataractous lenses. The spectrograms showed that in cataractous lenses potassium was diminished and calcium increased.

Mr. T. Harrison Butler next read a paper on Sympathetic Ophthalmia, which was discussed by Messrs. S. H. Browning, Malcolm Hepburn, H. M. Traquair, and A. W. Ormond.

Doyne Memorial Lecture.

This lecture was given by Dr. Arthur Thomson, Lees professor of human anatomy in the University of Oxford, who chose as his subject Observations on the Eyes of Birds. After reviewing the literature of the past 250 years on the pecten he described its anatomy with the aid of slides and models. He showed how the most prominent portion of this structure which projects furthest into the globe is more closely attached to the hyaloid membrane overlying it than the lateral portions. The hyaloid lying upon this black pigmented structure acts as a dark mirror and its function may reasonably be taken to be that of eliminating dazzle from the direct rays of the sun, with reflection of objects from the upper field of vision to some other part of the retina. The value of this in the case of all birds other than prey-birds would be at once seen. The latter hovering with back to the sun and in the region of dazzle as far as the ground bird is concerned is in a position of vantage. If, however, the bridge of the pecten is a dark mirror, reflecting the image of the prey-bird, nature has provided the ground-bird with a suitable means of defence.

At the conclusion of the lecture Prof. Thomson was presented with the Doyne memorial medal for the year.

Mr. G. R. de Beer, lecturer in comparative and experimental embryology in the University of Oxford, then gave a paper embodying original work on the development of the vertebrate eye.

In the afternoon a visit was paid to the Morris Motor Works.

On Saturday morning the session opened with a paper by Lieut.-Colonel Henry Smith, on the Nutrition of the Lens and Vitreous. On analogy with the uterus with its rhythmic contractions as a means of maintaining circulation and thereby nutrition, he suggested that a sluice-like action of the ciliary muscle of the eye occurred whereby the canal of Schlemm and neighbouring spaces were opened and relaxed and so aided the circulation of the aqueous humour.

Clinical Cases.

Reports were given of the following cases:—

Miss Ida Mann: "A Congenital Abnormality of the Retina."

Mr. John Rowan: "A Case of Gliomata of the Retina." Both eyes were removed for gliomata at 1 year and 5 months; no recurrence after over three and a half years.

Mr. George Young: "A Case for Diagnosis." Enuresis up to the age of 17, which disappeared after correction of some hypermetropic astigmatism.

Mr. J. A. Ross: "Keratitis with Intranasal Causation." Keratitis of 15 years' standing cured after treatment of an anterior ethmoiditis.

Mr. C. G. Russ Wood: "Case of Mikulicz's Disease with Complications."

Mr. W. Niccol: "A Case of Recurring Membranous Conjunctivitis."

Miss Marion Gilchrist: "A Case of Keratitis Marginalis Profunda occurring in Both Eyes."

In addition to the scientific exhibits a commercial museum was on view in which 14 well-known makers of ophthalmic instruments showed their latest forms of apparatus.

The attendance at the Congress was well over a hundred; the absence of members from abroad is to be explained by the fact that the International Congress of Ophthalmology falls next year at Amsterdam.

PATHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

A MEETING of this Society was held in the University New Buildings, Edinburgh, on July 13th and 14th, Prof. J. LORRAIN SMITH, Prof. T. J. MACKIE, and Dr. A. G. MCKENDRICK in the chair.

W. M. CROFTON (Dublin) described a pleomorphic microbe which he had isolated from vaccine lymph and small-pox, and IVY MACKENZIE (Glasgow) dealt with another organism, obtained on many occasions from the cerebro-spinal fluid of an obscure nervous case, which appeared as threads cocci or diphtheroid bacilli, Gram-positive and Gram-negative, under different conditions.—L. S. P. DAVIDSON (Edinburgh) had found a great excess of *B. welchii*, *B. coli*, and streptococci in the stomach contents and fæces of cases of pernicious anæmia; the degree of sepsis was not altered when the anæmia was cured with a liver diet. No special type of organism could be identified as associated with the disease.—J. CRUICKSHANK (Aberdeen) pointed out that the Voges-Proskauer reaction (due to the production of acetylmethylcarbinol by certain intestinal bacilli) was obtained more quickly and certainly if glucose in the medium was replaced by cane-sugar.—D. P. D. WILKIE (Edinburgh) in cases of cholecystitis found streptococci much more frequently in the cystic lymph gland than in the contents or wall of the gall-bladder; the cocci thus obtained when repeatedly inoculated into rabbits produced a chronic cholecystitis and gall-stones.—H. J. PARISH and C. C. OKELL (London) retested 533 Schick-negative children one to seven years later and found 1·1 per cent. positive; of 440 children who had been made Schick-negative by immunisation 5 per cent. proved to have become positive after about the same length of time.—J. A. ARKWRIGHT (London) discussed the parallelism between acid and serum agglutinations.—C. H. BROWNING and E. M. DUNLOP (Glasgow) dealt with the influence of the amount of alcohol in the mixtures on the Wassermann reaction.—E. M. DUNLOP (Glasgow) described his observations on the fixation of complement by typhoid and other bacilli. and T. J. MACKIE (Edinburgh) discussed the action of normal serum and some non-antigenic substances.—J. GORDON and A. WORMALL (Leeds) had investigated the relationship between the bactericidal action of normal serum and its content in hæmolytic complement.—D. F. CAPPELL (Glasgow) found that filling up the reticulo-endothelial cells with, e.g., trypan blue had no influence one way or the other on the susceptibility of mice to pneumococci.—J. L. OWEN (Leith) argued that the present methods of determining blood groups were unsatisfactory owing to variations in titre and the presence of the third (Cγ) component, which might occur without A or B. Direct cross-testing between donor and recipient was the only safe procedure.—G. M. FINDLAY (London) explained the determination of bacteria to a locus of tissue injury by showing that injections of histamine had the same effect.—C. PRICE-JONES (London) had measured the red cells in a number of cases of pernicious anæmia before and after treatment with liver, and showed that the cure of the anæmia did not remove the excess of abnormally large cells, though it usually brought the diameter curve nearer the normal shape and position.—C. J. POLSON (Manchester) described his experiments on the disposal of dialysed iron injected intravenously by the reticulo-endothelial system.—C. DIVER, F. M. TURNER, and A. E. BOYCOTT (London) gave an account of the inheritance of reversed symmetry and the non-inheritance of monstrous shell-shapes in a mollusc.—J. LORRAIN SMITH and T. RETTIE (Edinburgh) studied the intestinal absorption of fat in the guinea-pig and suggested that the mucosa stores fat in much the same way as connective tissue.—W. E. GYE and W. J. PURDY (London) described further experiments on the filtrability and stability of extracts of Rous tumours, and pointed out the parallelism between the action of various agents on the effective agent in the tumour and on the virus of pleuro-pneumonia.—A. L. TAYLOR and M. J. STEWART (Leeds) described six single and multiple plasma-cell myelomata; the clinical course is relatively benign.—H. G. CRABTREE (London) had measured the carbohydrate metabolism of various pathological epithelial overgrowths and found that lesions such as those of fowl-pox showed the respiratory features supposed by Warburg to be characteristic of malignant tumours.—J. S. YOUNG (Leeds) showed that hyperplasia of the pleural endothelium and of the nearby alveolar epithelium could be produced by injecting strong solutions of sodium chloride into the pleural sac and more readily by calcium strontium and especially aluminium salts.—D. M. MORISON (Edinburgh) tied the ureter and introduced dyes into the kidney pelvis; they were absorbed first by the lymphatics and afterwards passed up the tubules as far as the second convoluted tubule.—T. SHENNAN (Aberdeen) defended the proposition that external mechanical violence often plays a part in producing partial or complete tears of the healthy aorta.—D. F. CAPPELL (Glasgow) showed three instances of vertebral chordoma, and W. SUSMAN (Manchester) an obscure, probably neurogenic, sacral tumour. T. D. HAMILTON and N. M. DOTT (Edinburgh) correlated the cytological characters of cerebral gliomata with their clinical history. G. MCCALLUM (Edinburgh) described an ovarian teratoma in which carcinoma and chorion-epithelioma developed.—A. W. GREENWOOD, C. F. W. ILLINGWORTH, and R. D. MACKENZIE (Edinburgh) showed a new transplantable fowl tumour; C. F. W. ILLINGWORTH a series of specimens of cholesterosis of the gall-bladder and the mechanism of formation of cholesterol stones on a pigment nucleus. W. G. BARNARD (London) showed giant-cells in organising broncho-pneumonia, queer bodies in granulomata in a rabbit's lung, and a mass of fungi crowded with tubercle bacilli in a tuberculous cavity in the lung.—W. Q. WOOD and D. P. D. WILKIE (Edinburgh) had an exhibit of carcinoma of rectum.—E. M. DUNLOP (Glasgow) showed two unusual organisms from urinary infections, D. F. CAPPELL (Glasgow) a tumour of pleura with glomerular metastases, W. F. HARVEY (Edinburgh) pathological conditions associated with heat-stroke and a series of large microscopic sections. D. G. S. MCLACHLAN (Edinburgh) demonstrated the formation of "clubs" round masses of tubercle bacilli injected intravenously.—T. SHENNAN (Aberdeen) showed how any ordinary photograph can have the parts required marked in with Indian ink and then the rest be bleached with iodine and acid hypo, leaving a black-and-white line and dot drawing.

STOCK EXCHANGE DERBY FUND.—From the Stock Exchange Mutual Subscription Fund, popularly known as "the Stock Exchange Derby Sweep," a sum of £50,530 has been allocated to a long list of charities, chiefly hospitals, being rather more than 10 per cent. of the total amount received.

nd Notices of Books.

RS.

J. NORMAN, M.B., D.P.H. Edin.,
rintendent, Camberwell House,
urer on Mental Diseases, West-
tal Medical School. Edinburgh:
gstone. 1928. Pp. 463. 14*s*.

fully justified his temerity, as he
s preface, in adding yet another to
books on mental disorders. There
s in this handy volume, and it is
vith a literary knowledge which
attention of the reader.

s with a section on the common
ding mental deficiency. This is
art which deals with historical
athology, treatment, and legal
ext section commences with
d classification, and passes on
d melancholia. There is no
volutional type of depression
rately in most recent works.
presentation of the phases of
on in manic depressive states
rman records several points
depressive patient which are
n much longer works. For
t the delusions in manic de-
ersist in active or latent form
f normality. This phenomenon
practice, but seldom recorded
hrenic reactions are dealt with
d delusional insanity, a term
or includes brief descriptions
phrenia. There are certain
ued use of such a general term
" in view of the close similarity
anoides, paranoia, and para-
ions are well described, and it
icult task to keep the book
. Dr. Norman divides the
hysteria, neurasthenia, and
ids the term anxiety neurosis,
bsessional neurosis. He does
psychopathology, and leaves
cho-analysis in the treatment
re is much to be said for this
e this handbook is likely to
become popular with medical students, whose education in these matters requires to be undertaken with great care.

In the chapter on mental disorders associated with bodily diseases, it is surprising to find no mention of heart disease; disseminated sclerosis is ignored in the chapters devoted to mental disorders associated with organic disease of the nervous system. The urgency of early recognition of general paralysis might well be insisted upon in a future edition. The results of modern therapy are sufficiently impressive to make the early diagnosis of the disease a matter of great moment. Failure on the part of the practitioner to insist on venepuncture and lumbar puncture as soon as there can be any suspicion of general paralysis may well come to be regarded as negligence by the public. Apart from these small points, the account of the mental disorders is one of the best presentations available for the busy student of medicine.

The section on psychology reflects the author's leaning towards the physiogenic school of thought. He is anxious to correlate disordered conduct with disordered neurones. Consequently, the school which regards the wish as the unit of mind is not very adequately represented in the text. Here, again, it is better that the student should be told nothing at all, than be given inaccurate and distorted accounts of the psychological concepts which have resulted from the work of Freud. Unique among text-books is the charming chapter on "clinical examples in life and literature." From the enormities of some of the Cæsars to the adventures of Mr. Preemby in "Christina Alberta's Father," Dr. Norman gives us a glimpse of a veritable gallery of insane portraiture drawn from history and literature. The reading of this chapter provides a great stimulus to the interest of a casual reader, and is likely to promote interest in mental disease among both students and practitioners. Finally, there are adequate chapters on mental deficiency, on pathology and treatment, and on the legal relationships of insanity. The bibliography at the end of the book reflects the wide reading of the author, and is a most useful appendage to the volume.

This book can be commended especially to the medical student. It contains a great deal of matter in a small space, and is admirably printed and illustrated. Dr. Norman is to be congratulated on his success in the apparently impossible task of writing a short text-book on mental diseases which will give the veteran fresh ideas and new outlooks, and will provide the recruit with a sound grounding in psychiatry.

TEXT-BOOK OF PATHOLOGY.

Lehrbuch der Allgemeinen Pathologie und der Pathologischen Anatomie. By Prof. H. RIBBERT. New edition by Dr. CARL STERNBERG, Professor of Pathological Anatomy, University of Vienna. Leipzig: F. C. W. Vogel. 1928. M 45.

Ribbert's well-tried text-book of pathology has been happily reinspired by Prof. Carl Sternberg. The volume is up to date and accurate. It is intended for students, and does not take the place of such works as that of Aschoff, though the chapter on fat necrosis seems to show a certain coincidence of matter and phrasing—perhaps inevitable in the circumstances in the two volumes. The 700 illustrations include a photograph of a female corpse burnt to death which seems redundant. Monstrous twins are stressed too much in a book which dismisses blood diseases and malaria rather summarily. The treatment of arterial diseases is particularly good. The volume will not tell the specialist in pathology much that he did not know, but it covers with excellent judgment the whole field of morbid anatomy, and to a less degree morbid histology.

FOOD INFECTIONS AND FOOD INTOXICATIONS.

By S. R. DAMON, A.M., Ph.D., Associate Professor of Bacteriology, The Johns Hopkins University. London: Baillière, Tindall and Cox. 1928. Pp. 266. 18*s*.

FOOD may be poisonous to man because of the presence of inorganic chemicals, organic poisons, pathogenic bacteria, or larger parasites. Classification is not simple, however, because some pathogenic bacteria, such as *B. botulinus*, do not actually invade the human body but cause disease by reason of the exo-toxin they produce when growing in food substances. This exo-toxin acts like an organic chemical poison, and the disease botulism resembles an intoxication more than an infection. Dr. Damon has attempted such a logical classification and divided his book into three parts, dealing respectively with infections from food, intoxication from food, and parasitic infections acquired through food. This makes a convenient grouping for Salmonella infections, tuberculosis, undulant fever, and actinomycosis because these are all true infections, but, though logical, it savours of pedantry to divorce botulism from other microbic diseases, and make it keep company with potato poisoning, the poisonous fishes, and toadstools under the heading of *intoxications*. It might be expected also that the author should have found a place for the inorganic poisons, arsenic, lead, copper, and zinc, since the organic poisons have been given a good deal of room. Within its compass the book gives a useful and reliable account of food poisoning and provides an adequate list of references to further sources of information. The author is on safer ground when dealing with the purely scientific aspects of the question; that his clinical observations are not always well founded is illustrated by his remark that the only two really important diseases from which the Salmonella infections need to be differentiated are dysentery and enteric fever. Readers introduced for the first time to the gruesome menace of botulism may be disappointed when they turn over the pages a second time to look for some comforting statement as to how this disease, fortunately extremely rare, can be prevented by the reheating of food. Many supporters of the cleaner milk movement in this country will feel that pasteurisation should have received more than one paragraph, and that arguments for and against its use cannot be fairly stated in a single sentence.

It has been said that food is the one subject in which everybody is interested. There is little doubt that this book will be widely read and act as a useful source of knowledge.

THE MENOPAUSE.

Die Wechseljahre der Frau. Von Privat-dozent Dr. HANS ZACHERL, Assistent der Universitäts-Frauenklinik in Graz. Vienna: Julius Springer. 1928. Pp. 127. R.M.750.

This paper-covered book on the menopause contains a series of post-graduate lectures delivered by the author. A section of ten pages deals with the physiology of the menopause, including its hygienic management, but the greater part of the book is concerned with its pathology, including hæmorrhage, diseases of the genitalia, and functional troubles such as vertigo, flushings, and other vascular and nervous phenomena. It is not to be expected that in such a slender volume all the diseases occurring at the menopause should be fully dealt with; for example, only about two pages are devoted to cancer of the uterus. The chief value of the work lies in the fact that attention is directed to diseases and functional disturbances *peculiar* to the menopause. In many respects the pathological nomenclature used differs from that familiar to British readers. Among the causes of menopausal metrorrhagia is included abnormal persistence of the Graafian follicle, which becomes cystic and palpably enlarged. The bleeding in these cases may be so severe as to lead to fatal anæmia, and is accompanied by enlargement and softening of the uterus and thickening of the mucosa. One of the commonest causes of pathological hæmorrhage at the menopause is stated to be defective power of inhibition of the corpus luteum leading to sudden ripening of the follicle. The ovary contains numbers of large and small, mostly atretic, follicles, and the endometrium undergoes hypertrophy and becomes polypoidal. Other causes of menopausal bleeding are fully discussed—e.g., arterio-sclerosis, vasomotor disturbances, and "adenomyosis." In the account of the last-named condition no note is taken of British or American work. The book is well worth the attention of British readers, if only for the frequency with which familiar conditions are viewed from an unfamiliar standpoint. A good discussion of the German literature on each subject is included, and a bibliography of some 300 references is appended.

EXPERIMENTAL MEDICINE.

An Introduction to the Study of Experimental Medicine. By CLAUDE BERNARD. Translated by HENRY COPLEY GREENE, A.M. New York: The Macmillan Company. 1927. Pp. 226. 12*s.* 6*d.*

THIS book, which first appeared in 1865, is now a classic. But the publication of Mr. Greene's excellent translation gives us an opportunity of directing the attention of the younger members of the profession, and especially of those engaged in research, to an admirable work. Every student of medicine knows of Claude Bernard as a great physiologist: few are aware that he sat in the Chair of Medicine at the Collège de France, while none, unless he has read this book, can follow closely the spirit in which his work was accomplished. This introduction to the study of experimental medicine, as Prof. Lawrence Henderson points out in his appreciation of the author, gives to the student some understanding of the art of research, and of the inevitable conditions and limitations of scientific discovery—in short, makes him understand what science really is. He will learn from the numerous examples which Bernard draws from his own investigations something of the working of the mind of a man of genius, notably the necessity for philosophic doubt, for the avoidance of fixed ideas, and for the preservation of freedom of mind. The book is more than a mere practical guide to the research worker as to how discoveries have been and are to be made. It meets and deals adequately with the criticism directed even to-day against experimental medicine by physicians of repute. The fact that medicine must always be something of an art does not imply that it should remain purely a science of observation. It is not sufficient merely to observe and foresee the course of diseases, and it is doubtful if even the most ardent disciple of Hippocrates acts up to the strict tenets of his faith by refusing to attempt in any way to alter their natural progress. Observation of patients must always be the constant basis of medical studies, empiricism acting more or less blindly is a valuable ally, but it is by the experimental method that we can most certainly isolate the essential elements of a disease, grasp its characteristics, and guide its treatment.

Paul Bert, the pupil and successor of Claude Bernard, praised this book for the masterly exposition of the rules of the experimental method, for the clarity of the attack on the great problems studied, and for its admirable literary style. In the translation these merits are no less obvious.

ALLEN'S COMMERCIAL ORGANIC CHEMISTRY.

Fifth edition. Vols. IV., V., and VI. Edited by S. S. SADLER, E. C. LATHROP, and C. A. MITCHELL. London: J. and A. Churchill. 30*s.* per vol.

VOL. IV. (740 pages) deals with the characteristic constituents and analysis of essential oils, resins, indiarubber, gutta-percha, balata, &c. The essential oils are discussed in two sections, one describing the individual oils, and the other the various chemical substances found in them. Comparison of this volume with the corresponding one of the previous edition shows that it has been largely rewritten and contains much new matter, more particularly in those sections dealing with general methods of analysis and with investigations of resins and of the important constituents of essential oils. The source and properties, physical and chemical, of these oils which play an important part in medicine, are set out clearly and concisely. The long interval between the publication of Vol. IV. and the two subsequent volumes caused some inconvenience to those who use this work for reference, and it is to be hoped that the concluding volumes will soon appear. The subject matter of Vol. V. (700 pages) includes tannins, the different kinds of ink, colouring matters of natural origin, and colouring substances in foods, benzene, aniline, pyridine, acridine bases, and so forth. Mr. Mitchell's discussion of inks is full of interest; there is a surprising amount of chemistry involved in their manufacture. Included in this volume are benzene and its homologues, logically leading up to the subject of colouring matters and synthetic dyes, to which the whole of Vol. VI. (658 pages) is devoted. This volume consists mainly of two long articles which cover the field of identification of the dyestuffs, and the testing of the substances obtained by splitting up the dye colour. To the colour chemist this volume will be invaluable.

THE price of "Simple Goitres," by Colonel R. McCarrison (Baillière, Tindall and Cox) is 10*s.* 6*d.*, and not as stated in our review of July 7th (p. 17).

THE LANCET.

LONDON: SATURDAY, JULY 21, 1928.

THE DEMAND FOR RADIUM.

THE International Conference on Cancer, the proceedings of which commenced on Tuesday morning last, has given already an opportunity for serious consideration in respect of the shortage of radium, which is occurring exactly at the period in its therapeutical history when its value is being definitely recognised. It can be taken for granted that, as the discussions in the various Sections of the Congress go forward, further evidence of this shortage will be forthcoming, but sufficient emerged on the first day of the proceedings to show that there is likely to be a demand for radium that cannot easily be satisfied, although it is the legitimate outcome of scientific investigation. It would seem to be a duty upon all authorities whom our profession immediately serve, to endeavour to obtain an improvement of the situation. Taking our own country as an example, there is no doubt that we are under-supplied with radium for medical purposes, and this can surely be said for other countries where medical research and scientific therapeutics are equally largely at the service of the community. The discussion at the International Conference on the relative value of surgery and radiation in the treatment of three of the most formidable regional divisions of malignant disease proves the difficulty of obtaining a sufficient supply of an invaluable weapon of treatment, and that this should be the situation to-day is tragic. For the use of radium in the treatment of cancer is not a new form of treatment or still in the speculative stage. It was introduced over 20 years ago, although at first the demand was small. Indeed, it may be said that for ten years after the introduction of the treatment the large majority of the medical profession was sceptical of the value of radium in malignant disease. Now, however, the position is altered, and those who are in touch with modern methods are convinced that radium, when properly applied, is a very valuable curative agent in malignant disease. This conviction has not been the outcome of any particular form of propaganda directed towards the optimistic view; rather it represents the massed opinion of a good many observers who have arrived at their conclusions individually, while to some extent the public also has been able to see the good results which have followed well-directed radium therapy, when the treatment has been applied properly to the appropriate cases. We may therefore assume that the medical advisers to the Ministry of Health are aware of the increased confidence now being placed in radium, and are also aware that in the not very distant future pressure may be put upon those in authority to assist in procuring it in response to urgent requiral.

It may be useful to pass in review some of the stages in the world's production of radium, and in particular to note the marked fluctuations in price. Soon after its discovery and isolation by Prof. CURIE and his wife, Madame CURIE, radium was prepared in several laboratories, when it was possible to sell it at as low a price as £2 per milligramme of the element. Then Prof. GIESEL in his laboratory at Brunswick, among others, prepared radium bromide of a high grade of purity at the same moderate price. When, however, radium began to be produced on a commercial scale the price rose rapidly, and throughout the war, when radium was in big demand for other than medical purposes, the price rose to £30 per milligramme of element. From that price it has fallen, but the figure is now about £12, and the price seems likely to remain about the same for intelligible reasons. The war had its special conditions, but it is natural to inquire whether there is any justification for charging £12 for an article which can on a laboratory scale be sold at a profit for £2. It would appear that here we have an unusual case where what is possible in the laboratory is not possible in the factory, and that small production is cheaper than large. The operations involved in the extraction of grammes from even a high grade ore is a large scale operation involving spacious premises, much labour, and many skilled operators, while at the moment there is but one source of mass supply of raw materials. At first Europe provided the supply, but, when the European reserves had been exploited, the American producers found that it paid them to extract radium from a very poor grade ore known as carnotite. This situation may have justified the enhanced cost, but now a find of much richer mineral in the Belgian Congo has resulted in the Belgian owners, the Union Minière de Katanga, becoming producers for the world of radium. Practically speaking, the radium that is now being bought and sold all comes from this source, while the monopoly bids fair to exist for some time. It would seem that only a discovery of a new source can ease the situation, but it would have to be a really rich deposit that was found before entry into competition with the existing producers would be profitable. All effort, however, to reduce the cost of radium is worth while. If medicine requires in this country say 20 g. of radium annually for the treatment of cancer about a quarter of a million pounds must be paid for it. This is a considerable sum even for a rich country to contemplate the spending of, while poor nations are hopelessly penalised at the present time.

The expense of radium makes it very necessary to consider, after it has been obtained, how it should be used, and what machinery, if any, can be put into action which will ensure its most efficient and most economical employment. If the proceedings at the Conference supply suggestive answers to these questions much practical good may result. Radium therapy has reached its present position largely as the result of a number of individual persons carrying out clinical work on cancer in an earnest spirit of investigation; a good many countries have contributed their individual researchers, and among these France is prominent indeed. It was right, therefore, that it should fall to Prof. CLAUD. REGAUD, the much respected head of the premier Radium Institute in the world, to open the first series of debates on the therapeutic value of radium, while his views on one of the questions set out above are already known. For Prof. REGAUD has expressed the opinion that it would be a mistake to increase in France the existing number of anti-cancer centres where radium therapy is employed, holding clearly that radium work is of a highly specialised kind and should be as far as possible centralised. This opinion may hold a very definite message for our country. Though there are no anti-cancer centres so-called in this country, there are quite a number of foci where radium therapy has been going on for some years. The radium investigations initiated by the Medical Research Council in 1921, and continued since then, need no special mention at this stage to our readers, but it might be well to bear in mind the 12 centres which are included in this scheme, and to realise that here, at any rate, are centres where current technique is known and practised, and where new modes are tried out and developed. It might therefore be profitable to discuss the possibility of such centres acting as coördination units in a national scheme of radium therapy. The extension of radium therapy to many of the poor-law institutions of the country would appear to be inevitable in some form or other, and they would have nothing to lose, but much to gain, by being affiliated with centres which have been through the difficult period of probation.

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THE PROBLEM OF HOOKWORM.

SEVEN years ago the conclusion was reached by certain workers on hookworm that it is futile to try to determine with the microscope whether the last ultimate parasite has been removed from an infected patient. Their technique was unspecified, but their dictum undoubtedly encouraged the practice of treating whole communities as infected on the ground that hookworm had been found in individuals. When this plan has been adopted the anthelmintic drug has sometimes killed people whose infection was quite unproved, and these casualties have brought into disrepute, and even ended, local campaigns against the disease. While CLAYTON LANE has clearly established how great are both the bionomic and economic human benefit accruing from disinfestation of a community paralysed by the disease, and has also shown that there is no scientific justification for the assumption that the lightly infected are of no importance in public health, he has condemned this herd treatment without diagnosis as impolitic, unscientific, and immoral. If this is so, there is no escape from the necessity to determine the presence or absence of the last ultimate hookworm. The proportions of the task may be seen in his estimate that 800 millions of mankind are infected with the worm. Since each person requires individual and accurate diagnosis, diagnostic technique becomes at once of prime importance.

Diagnosis must rest on examination of fæces for ova, and for this some method of concentrating ova and separating them from the obscuring fæcal material is necessary. With the vast numbers to be examined it is essential that both concentrative preliminary preparation and microscopical examination be made so far fool-proof that they can be delegated under supervision to the cheapest labour compatible with accuracy. The mass diagnosis of hookworm infection must be free from error and must not be costly. On the forbidding quest for a particular concentrative method which would best fulfil those conditions, CLAYTON LANE has spent ten years.[1] He adopted the principle, neglected by others, that any technique, "concentrative" or "control," which from the same evened quantity of fæces habitually delivered, quantity for quantity, more ova than did any other, was of necessity the most nearly accurate. Repeated testing, under similar conditions, of the various concentrative techniques in use, by such "control of controls," has given illuminating results. In this searching trial the method of direct centrifugal floatation (D.C.F.) which he devised, developed, and standardised, has proved the most efficient for those who require certainty in diagnosis of the presence or absence of hookworm ova, and accuracy in counting them. Its accuracy and easy readiness in use have already been demonstrated both in the hospital laboratory in England and in the hookworm field in the tropics, where its more extended employment, as it is inexpensive, waits only on wider publicity for its advantages. D.C.F., in the first or diagnostic spin, and using rapid lift, collects on the average 80 per cent. of the hookworm ova present in 1 c.cm. of fæces in a light infection. Pushed to finality it has not shown an ovum content persistently less than about 30 ova per c.cm., but CLAYTON LANE has marshalled cogent evidence to show that this represents "the minimum ovum content normal for hookworms"—that is, the number of ova present in 1 c.cm. of fæces if a single female is ovipositing normally.

Direct centrifugal floatation collects trichostrongylus ova with the same facility as it does hookworm ova, and also, in striking manner, giardia cysts. Its author is to be congratulated on a patient and admirable research whose result, long needed, is of immediate usefulness and value. It makes possible that high diagnostic efficiency which, he insists, is indispensable if the hookworm problem is to be solved by humane and scientific means; for however convinced an administration may be of the moral and material benefits of disinfestation, the money is nowhere available in the tropics to carry this out on a country-wide scale. Every farthing, therefore, spent on every section of the campaign must be made to produce the greatest possible benefit; and it has not yet been seriously envisaged that prevention of infection for most of the hundreds of millions of human beings now exposed to infection and reinfection can proceed otherwise than by expulsion of the parasite from those carrying it. It is true that if all wore boots, or could use the conveniences of a water-borne sewage system, the infection would become a rarity. In fact the 800 million infected are barefooted, and—what is vital to the problem—are left to their own particular, and too often peculiar, fancy as to where they shall defæcate. Attempts to control this wayward fancy are wisely held up until effective latrine systems can be devised. The only basis of efficiency here is accurate knowledge of the bionomics, and especially the migratory powers of the infective ankylostome larva. Its life in fæcal material and soil has repeatedly been studied, notably of late by many American workers. Vertical migration of the larvæ was noted, but their recovery from a culture has been considered a dependable measure of the number that had developed; and their disappearance a token of their death. Then FÜLLEBORN'S experiments demonstrated that strongyloides larvæ at the infective wandering stage migrated in every direction and every plane. Now CLAYTON LANE[2] shows by ingenious experiments, in conditions in which there was control of single factors, that ankylostome larvæ migrate laterally as well as up and down; and that, in hydraulic or other conditions favourable for migration, the better nourished and the more vigorous (that is, more capable of producing infection) the larvæ, the fewer will remain behind to be enumerated. Their absence often signifies not their death but their vicious vitality. In his experiments every culture was surrounded by a water trap into which the migratory infective larvæ tumbled. It was noted that few escaped from this water trap—a plain pointer to the style and form of the effective anti-ankylostome latrine. Untrapped cultures, therefore, can afford no assured indication as to viability of hookworm ova, longevity of larvæ in soil, or their migratory capabilities. And it is on untrapped cultures that nearly the whole of our supposed knowledge on these essential matters is at present based.

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[2] Trans. Roy. Soc. Trop. Med. and Hyg., 1928, xxi., 309.

DICHOTOMY OR FEE-SPLITTING.

WE published last week a letter from a correspondent, who gave a very good reason for remaining anonymous, on what he described as an obnoxious practice which he had reason to believe is rapidly extending in certain parts of London. This practice consists in the diversion of part of a consultant's fee, without the knowledge of the patient, to the practitioner who has advised the consultation. The patient believes that his whole payment is made to the surgeon or physician who has been called in, whereas part of the fee has, in fact, been deducted as a commission for the practitioner. There are, we have been assured, a large number of consultants in this country who have no cognisance of any such practice, and these may be inclined even to question its occurrence, but it may be recalled that several years ago, in accordance with a widely felt desire, a meeting of consultants and specialists was called in a provincial centre to discuss the practice, and two resolutions were passed and circulated to all the practitioners in the neighbourhood. The resolutions were worded thus :—

1. It is improper for a Consultant to transfer any portion of his consultation- or operation-fee to the Practitioner who has called him in. The Consultant who offers or agrees to such payment, however innocently, is open to the suspicion of paying a "commission" for his own advantage. The Practitioner who accepts or asks for it cannot maintain the position of a trusted and unbiased adviser as to the need for a consultation and the selection of a Consultant.

2. No Consultant or Specialist shall pay to the General Practitioner who is associated with him in a case any part of an operation-, consultation-, or so-called "inclusive" fee, unless he informs the patient or his representatives of the services for which the payment is made and the amount of such payment.

The situation is one which has been freely discussed for some time past in the United States of America, and at its April meeting the New York Medical Society received a report on the subject from its Committee of Economics. This report was, it appears, tabled without any vote being taken upon it, and our contemporary, *American Medicine*, in expressing its disapproval of the abortive result adds it would be interesting to have some patient sue a member of the profession for the return of money known to have been paid to the doctor referring the case. The word "known" is the crux, for in this country and, presumably, also in the United States, both the offer and the acceptance of a secret commission are punishable at law, and evidence is therefore difficult to come by. A mass of information is, however, now available owing to the action of the *Medical Journal and Record* (of New York) in throwing open its columns to its readers in the form of an "open forum," without editorially taking any sides in the matter. A questionaire was submitted to readers with the remark: "We want you to have your say, and we want you to be indulgent enough, if indulgent it may be called, to hear what the other man has to say, and so the matter stands. This is your department. Make use of it." The material result has been some 55 columns of print embodying the personal views of several hundreds of doctors. These views are extremely varied. Two groups, as no doubt was to be expected, predominate—namely, those who wish to deny, with more or less emphasis, the existence of the practice at all; and those who have utilised the opportunity for criticising the behaviour of their colleagues with an extreme, if not imaginative, freedom. It seems clear, from the mere number of the former group, that there are many members of the medical profession, especially in the Eastern States and their large towns, who have not come in contact with fee-splitting at all; whereas it is equally evident that in the Middle West, and still more in the Southern States and in Texas, fee-splitting is by no means exceptional. A New Orleans correspondent states that in Louisiana it is a common practice; in Alabama it seems to have been almost a rule 15 or 20 years ago, although not nearly so prevalent now; in Ohio a signed contribution states that it is universal, while a Wilmington practitioner understands, in a general way, that many of the general surgeons and specialists in Cincinnati split fees with small-town doctors who refer them cases. A Minnesota physician remarks that the practice is quite inevitable under present conditions, the large fees received by surgical specialists being its foundation. The ex-president of Iowa State Medical Society says, quite frankly, that 75 per cent. of the doctors of Iowa and Nebraska "want splits." These examples may suffice to give some idea of the relative prevalence of fee-splitting in the various United States. The report does not cover Latin America, if only for the reason that division of the total fee paid between the specialist and the family doctor is apparently the accepted practice there.

Something has already been said, incidentally, regarding the circumstances which have brought about such a state of affairs. A New York correspondent's statement may be given as an example. He writes: "The newcomer, or unknown specialist, in his desire to increase his clientèle, *offers* part of his fee as an inducement to the family physician. Many young surgeons find it impossible to build up a practice any other way. Some prominent specialists with good followings take into consideration the plight of the referring physician and give him a portion of the fee on the basis of good fellowship." For these reasons he regards the hope of eliminating fee-splitting completely from medical practice as rather meagre, and there is, in fact, throughout the symposium not only a wide admission of the practice and of its inevitability, but a good deal of justification for it. The legal profession, writes a Baltimore physician, splits fees and finds nothing wrong with it. (The analogy would fail in this country if applied to a busy barrister sharing his fee with another barrister who has devilled a case for him, for there is no element of agency.) A New York physician feels that for the younger man fee-splitting should be legitimatised, for it cannot be eradicated. As a remedial measure another suggests the sharing openly of the surgical fee between the surgeon and the practitioner who refers the case, the surgeon receiving two-thirds or three-quarters of the fee, and the medical man openly receiving one-third or one-quarter. An official of the Prudential Insurance Company remarks that fee-splitting amounts to doing the right thing in the wrong way. From Denver comes the suggestion that the patient should be informed of the fact that the diagnosis of the surgical condition by the attending physician is frequently worth as much to the patient as the operation itself. The practitioner should therefore have courage enough to charge for his diagnosis and time; and, if need be, the specialist should mention to the patient that he is cutting down his fee so that the patient can pay the family doctor. The hardship is specially well stated by a New York contributor, who writes: "The family physician who calls with his patient to the consultant and spends from two to three hours or more, or visits the operating room, he is entitled to a reasonable fee. The patient should be told by the consultant or surgeon that his fee covers the fee for services of the family physician. *Call* it a collective fee or what you please. Patients will not pay the family physician any additional conference fee." And another remarks: "It is rather peculiar that it is perfectly ethical for the surgeon to pay his assistants out of his fee and yet not allow the family physician to assist and pay him." The situation is summed up in an article by Dr. A. L. Wolbarst, of New York, who after acknowledging that fee-splitting is a serious evil and one growing by leaps and bounds (not only in America but in Europe as well), describes it as the natural out-growth of the widespread specialisation in medicine, which Dr. Thayer deplored in his presidential address to the American Medical Association last month. Both the surgeon and the practitioner have come to realise that prosperity realise that here, at any rate, are centres where current technique is known and practised, and where new modes are tried out and developed. It might therefore be profitable to discuss the possibility of such centres acting as coördination units in a national scheme of radium therapy. The extension of radium therapy to many of the poor-law institutions of the country would appear to be inevitable in some form or other, and they would have nothing to lose, but much to gain, by being affiliated with centres which have been through the difficult period of probation.

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OCULAR MUSCLE BALANCE IN FLYING MEN.

THE successful handling of aircraft makes a big demand on visual acuity and balance. In examining pilots for flying aptitude, consideration was given mainly to visual acuity until it became established that "fast landers" almost uniformly possessed good visual judgment, whereas a large percentage of those who could not land manifested defective visual judgment. This led to tests for visual judgment being added to the usual routine ophthalmic examination. The tests deemed sufficient to expose the presence of muscle imbalance in flying personnel are set out on pp. 141 ff. of the Manual for Medical Officers of the Royal Air Force.[1] They include: (*a*) the convergence test; (*b*) the cover test; (*c*) the red-green (phorometer) test; (*d*) the Bishop-Harman diagram test. A typical case of poor response to the four tests mentioned would be one in which: (*a*) the convergence near point is over 4 in.; (*b*) the cover test reveals "neglect" or suppression in the case of the covered eye, so that it either failed to take up fixation or reacted in a very sluggish manner after being uncovered; (*c*) there is a separation of four or more inches (1–2 prism dioptres) between the superimposed red and green lights at 20 ft. or a marked hyperphoria; (*d*) a diaphragm result of four or worse (normal 0–1). Subjects with muscle imbalance, practically without exception, take a time considerably over normal before they learn to land—some, indeed, never learn to land at all. Those who show a tendency to exophoria flatten their machines out too early; those with esophoria are inclined to flatten out too late, and fly into the ground. These defects are naturally the more accentuated the faster the landing speed of the machine. That defective visual judgment, as demonstrated by the tests described, is actually the cause of many landing troubles has been amply proved by the effects of visual training, both on those pupils who had failed to qualify, or who were indifferent pilots when qualified, and on those pilots who concomitantly with disease or accident had developed ocular muscular defects. Visual training carried out either by means of Worth's amblyoscope alone, or combined with the stereoscope, as demanded by the type of case, has proved of great value. It is stated that pilots who were a trial to their instructors, and a source of danger to themselves, have, after successful training, not only developed into sound flyers, but have, in a number of instances, become well known as instructors at flying schools. Exceptions naturally arise from time to time as, for example, when a man has superimposed handicaps such as lack of flying temperament or inability to perform the fine coördinated movements inseparable from modern light machine flying. It appears that the most simple cases are those of pure exophoria which are found in pilots who: (*a*) had a tendency towards this condition on entry not sufficient to warrant rejection; (*b*) suffered from some illness, such as influenza, malaria, sandfly fever, or became gradually debilitated from tropical service; or (*c*) suffered from cerebral concussion after some accident. Types (*a*) and (*b*) require training for their correction; type (*c*) shows, in some instances, a remarkable power of righting with time unless the continued irritation of a diplopia has produced the monocular habit as a way of escape. Less simple are the esophorias, whether of the usual form with hypermetropia as a basis, or the so-called pseudo-esophoria of spasmodic character, produced sometimes by sun-glare, sometimes as a subconscious means of mastering the inroad of a mild exophoria. This condition raises the problem of the irregular control of nerve impulses, and it is open to controversy how it is acquired. An interesting type is that in which the "neglect" or "suppression" factor is predominant either as "monocular neglect" or "alternating neglect." In the first instance, one eye receives and registers continual impressions while the other registers impressions irregularly; in the second, one eye functions for a time and then gives way entirely to the other, and so on. The pilot with "alternating neglect" tends to fly his machine after the zigzag fashion of the snipe. In training these cases the "neglect" factor must first be dealt with if satisfactory results are to be obtained. Finally, there are a few pilots of the war school who possess only one useful eye. They have either lost the use of one eye in infancy and have acquired the "monocular sense," or have been spared the "master eye," and then fly, as it were, along a "memory sagittal line." There is much else of interest in the Manual; we have selected for comment a subject of immediate topical interest.

BOARD OR DEPARTMENT?

THE Reorganisation of Offices (Scotland) Bill, which is likely to become law before Parliament rises for the vacation, proposes to substitute Departments for Boards in the administration of health, agriculture, and prisons north of the Tweed. The Bill has other miscellaneous provisions relating to certain ancient legal offices, but the proposed changes in the constitution of the Scottish Board of Health and the Board of Agriculture for Scotland are those which have attracted the main attention. As in the similar Bill of 1924, they involve deleting the requirement that two medical practitioners, one or more women, and one practising lawyer shall be statutory members of the body administering health services in Scotland. These alterations will chiefly be viewed from three aspects. There is first the personal view, important enough to those whom it immediately concerns but liable to be overlooked by others—the view of particular officials whose prospects of promotion or superannuation may be affected. Next there is the wider view, suffused with the warm atmosphere of local patriotism—the view of those Scots who are satisfied with the institutions they have got and who are distrustful of any movement which may threaten the freedom of national contacts or may place some college-bred theoretically minded officialism above the native common sense and practical ability of Scotland. Finally, and at a marked disadvantage in popular support, there is the cold official aspect of a superior efficiency in administration, an impersonal abstraction associated perhaps in the all-seeing eye of the Treasury with some future prospect of economy or of a more perfectly standardised civil service free from any element of local patronage. The government of Scotland has its peculiarities and anomalies. By reason of the undeniable supremacy of the Parliament at Westminster there must be some minister in London—sometimes named the Secretary for Scotland, at other times (as now) one of His Majesty's principal Secretaries of State, specially charged with Scottish affairs—to answer for the conduct of Scottish government. Simultaneously the actual work of administration must be conducted at Edinburgh or elsewhere in Scotland by officers who have first hand acquaintance with the problems of that work. Thus there has been evolved at Dover House (the Scottish Office in Whitehall) a sort of post office or clearing house, an institution which would break down at any moment if it were not operated with remarkable competence and almost exclusively by a Scottish personnel. The Secretary of State has to consult the branches of Scottish administration in the north. He naturally knows it to be easier to communicate with a single official, the carefully selected head of a department, than to take the opinions and recommendations of the several members of a board which may not be unanimous. The board's advice may be a compromise, or the minister may have to adjudicate between the dissenting voices of majority and minority, and he knows that a collective mind is made up more slowly than that of a single individual.

There, then, is the issue. Is the Secretary of State to consult one person or many? Is he to deal with a super-civil servant or with a group of possibly independent advisers? If he listens to the expert administrator, will there not be a tendency to override or lies in the close economic coöperation which is represented by the split-fee. Under existing practice, the amount of the specialist's fee is paid to him, and he either retains it entirely, or returns part of it secretly to the family doctor, in the form of the illicit split-fee. "The time has come," he says, "for a revision of the code and for recognising the principle of open ethical fee-sharing as just and equitable." This modification of the code should provide that the specialist's fee shall include the doctor's fee, and it shall be deemed as much a violation of the code for the specialist to withhold the doctor's rightful share as for the doctor to demand, or the specialist to offer, more than the duly established proportion. He does not regard the plan as perfect, but submits it as likely to improve the position of all three parties to the bargain.

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[1] Air Publication, 1269. H.M. Stat. Office. 3*s.* 6*d.*

The symposium may, as we have suggested, not represent very closely the average medical view in the United States, but it will have afforded an opportunity of utterance for extremists in both directions. Nevertheless no one can read the testimony brought forward in this "open forum" without gaining the impression that there is a situation which is not being met by ethical action alone, and may require some adjustment to the changing conditions of medical practice, especially in relation to the development of specialisation in America.

Annotations.

"Ne quid nimis."

PNEUMONIA ON THE RAND.

In 1912, following a visit to the Rand by Sir Almroth Wright, a system was inaugurated of routine prophylactic inoculation of natives employed in the mines against pneumococcal infections. Since the independent discovery by Sir Spencer Lister, working at the South African Institute for Medical Research, and by American observers, that pneumococci can be separated into different serological groups, the vaccine used has been a mixed one. In 1919 [1] we commented on the progressive fall in the incidence and mortality-rates of lobar pneumonia in the large population at risk. The average annual death-rate for the years 1908 to 1911 was about 12 per 1000. After that it fell steadily, with the exception of a rise in 1915, which coincided with a reduced issue of vaccine; by 1918 it was already less than 4 per 1000. The descent in the curve has been attributed in South Africa and elsewhere to the use of the vaccine.

Unfortunately, though prophylactic inoculation is still being zealously carried out and the efforts to improve the hygiene of life in compounds have certainly not been relaxed, during the last few years the incidence- and mortality-rates have shown a tendency to rise. In the important group of mines controlled by the Rand Mines, Ltd., for example, the mortality-rate, which was under 1·5 per 1000 in 1920, has since risen again irregularly, until in 1927 it was only just under 5. An attempt to ascertain the factors responsible for this disappointing rise has recently been made by the Transvaal Mine Medical Officers Association. In August, 1927, following on a communication from the Gold Producers' Committee, the Association appointed a subcommittee, consisting of Dr. A. J. Orenstein (convener), Dr. H. Butt, Dr. A. Frew, and Dr. C. Scholtz, to report on the serious increase in mortality from disease among natives in the earlier months of 1927. For this increase the pneumonias were found to be mainly responsible. The subcommittee issued a questionaire to all mine medical officers in September last, and a critical summary of the information received is the substance of their report, which has now been printed in the Proceedings of the Transvaal Mine Medical Officers Association (April, 1928). The data under review concern the natives employed in 30 mines during the periods from Jan. 1st to August 31st in 1926 (168,000 boys), and in 1927 (166,000 boys). Of these, approximately 94,500 in each year were South African natives, the rest being from the East Coast. Both lobar and broncho- and influenzal pneumonias were studied and the tables and statistics on which the conclusions are based are set out in full. Some interesting results have emerged. For example, in both years approximately half the cases of lobar and of bronchopneumonia occurred in the first three months of employment; no definite correlation was observed between recruiting ratios and incidence and mortality from any form of pneumonia. The case mortality varied only slightly, showing that the severity of the attacks was not markedly different in the two years. The chief conclusions reached are that the physique of the native recruits plays a considerable rôle in both attack-rate and mortality-rate from the pneumonias; that natives sleeping singly in partitioned-off concrete bunks are less prone to attacks of pneumonia; that there is probably a periodicity in the incidence of pneumonias, and that the Witwatersrand mines are now going through a period of rise in the curve of incidence. A graph giving the incidence of pneumonias in Chicago between the years 1867 and 1925 lends support to this suggestion. No ground was found for any suspicion that slackness in vaccination might be responsible for the increased incidence and mortality. Some of the statistics on lobar pneumonia among underground workers seemed to indicate that pneumococcal vaccine gives better prophylactic results in one 2 c.cm. dose than in three c.cm. given in divided doses, which is the more usual method. On one mine only one inoculation of 1 c.cm. of pneumococcal vaccine was used, and except in the incidence of lobar pneumonia among East Coast natives, this mine had a smaller incidence than the average for all the mines. The recommendations made are that the physical standard of recruits should be correlated with that recommended by the Association, that all compound rooms should, as soon as possible, be fitted with partitioned-off concrete bunks, and that the whole matter of prophylactic vaccination should be exhaustively examined at an early date. At the meeting of the Transvaal Mine Medical Officers Association, to which this report was presented,[2] some of the medical officers spoke in favour of discontinuing inoculation. A better plan, and one which is likely to be adopted, is the suggestion that the natives on each mine should be divided into equal batches, of which one only should be inoculated. If administrative difficulties prevent this simple differentiation of employees, a certain number of mining areas could be set apart and used as controls. The opportunity for a clear test seems to have arrived. While the incidence- and mortality-rates were decreasing, it might not have been justifiable to withhold prophylactic treatment. But when these rates are rising, in spite of vaccination, there can be no ethical reason why a large-scale experiment should not be tried. It would be difficult to believe that the dramatic fall of the curve of lobar pneumonia in the years following 1912 was an epidemiological phenomenon independent of prophylactic vaccination; but should a controlled test on a rising curve show that vaccines have but little effect, the whole question will have to be reopened, since the expense involved must be considerable. The stumbling-block against the acceptance of the efficacy of vaccination has always been the fact that an attack of pneumonia confers no immunity, but the apparent success of inoculation in South Africa has been an argument difficult to controvert. The Transvaal mine medical officers have now an opportunity to devise a series of crucial tests which should provide definite evidence for or against the value of prophylactic inoculation against pneumonia.

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[1] THE LANCET, 1919, ii., 984.

[2] Journal of the Medical Association of South Africa (B.M.A.), June 9th, p. 309.

OCULAR MUSCLE BALANCE IN FLYING MEN.

THE successful handling of aircraft makes a big demand on visual acuity and balance. In examining pilots for flying aptitude, consideration was given mainly to visual acuity until it became established that "fast landers" almost uniformly possessed good visual judgment, whereas a large percentage of those who could not land manifested defective visual judgment. This led to tests for visual judgment being added to the usual routine ophthalmic examination. The tests deemed sufficient to expose the presence of muscle imbalance in flying personnel are set out on pp. 141 ff. of the Manual for Medical Officers of the Royal Air Force.[1] They include: (*a*) the convergence test; (*b*) the cover test; (*c*) the red-green (phorometer) test; (*d*) the Bishop-Harman diagram test. A typical case of poor response to the four tests mentioned would be one in which: (*a*) the convergence near point is over 4 in.; (*b*) the cover test reveals "neglect" or suppression in the case of the covered eye, so that it either failed to take up fixation or reacted in a very sluggish manner after being uncovered; (*c*) there is a separation of four or more inches (1–2 prism dioptres) between the superimposed red and green lights at 20 ft. or a marked hyperphoria; (*d*) a diaphragm result of four or worse (normal 0–1). Subjects with muscle imbalance, practically without exception, take a time considerably over normal before they learn to land—some, indeed, never learn to land at all. Those who show a tendency to exophoria flatten their machines out too early; those with esophoria are inclined to flatten out too late, and fly into the ground. These defects are naturally the more accentuated the faster the landing speed of the machine. That defective visual judgment, as demonstrated by the tests described, is actually the cause of many landing troubles has been amply proved by the effects of visual training, both on those pupils who had failed to qualify, or who were indifferent pilots when qualified, and on those pilots who concomitantly [illegible] disease or accident had developed ocular muscular defects. Visual training carried out either by means of Worth's amblyoscope alone, or combined with the stereoscope, as demanded by the type of case, has proved of great value. It is stated that pilots who were a trial to their instructors, and a source of danger to themselves, have, after successful training, not only developed into sound flyers, but have, in a number of instances, become well known as instructors at flying schools. Exceptions naturally arise from time to time as, for example, when a man has superimposed handicaps such as lack of flying temperament, or inability to perform the fine coordinated movements inseparable from modern light machine flying. It appears that the most simple cases are those of pure exophoria which are found in pilots who [illegible] had a tendency towards this condition [illegible] not sufficient to warrant rejection; (*b*) [illegible] illness, such as influenza, malaria, [illegible] or became gradually debilitated from [illegible] service; or (*c*) suffered from cerebral concussion [illegible] some accident. Types (*a*) and (*b*) require [illegible] correction; type (*c*) shows, in some [illegible] a remarkable power of righting with time [illegible] of a diplopia has produced [illegible] irritation way of [illegible] habit as a whether [illegible] exophorias, basis [illegible] heterotopia as a character [illegible] of spasmodic times [illegible] late, some- of a [illegible] the inroad problem [illegible] raises the and it [illegible] impulses, interesting [illegible] required. An "suppression [illegible] "neglect" or "mono[illegible] either as first in[illegible]." In the impre[illegible] continual irregul[illegible] impressions [illegible] functions for a

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[1] [illegible] Office, 3s. 6d.

BOARD OR DEPARTMENT?

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exclude the technical expert in health, housing, or agriculture? The Scottish Members of Parliament who object to the Bill have pointed out that there is no allegation of existing inefficiency; they have specially praised the administration of the boards which deal with health, agriculture, and prisons; they maintain that the proposals mean the denationalisation of Scotland and will hasten the advent of home rule. On this wider issue of autonomy and national sentiment Scotland will find support from the Welsh Members of Parliament who have lately been protesting against the proposed reorganisation of the Welsh Board of Health. To the latter the Minister of Health has replied that the abolition of a chairman and the reduction of the Welsh Board from four to three members is not part of a policy of denationalisation; the Board has not been an executive body; it has met not more than 28 times in the past nine years; its work is done by individual members in their individual capacities; the present change is a matter of internal administration only, a question of personal arrangements. This question of personal arrangements arises also in the Scottish proposals. The existence or the near prospect of certain vacancies has caused the administrative changes to be pressed forward now at a moment when they can most smoothly be effected. Sir John Gilmour appears to have given some kind of assurance that he will hold himself as accessible to his technical advisers as heretofore, though he frankly maintains that experts must be controlled. We do not, he observed, allow the military and naval experts to carry out all they desire. Similarly, "if the medical man had his way, he might possibly impose upon Parliament and the country a system eminently desirable no doubt but so extravagant or so much in advance of the time that Parliament could not tolerate it." Sir John Gilmour's best argument is that every inquiry and commission which has examined the science of administration has recommended the change he proposes. England has a Board of Admiralty and a Board of Inland Revenue; she has a Board of Trade (of which the Archbishop of Canterbury is a member amongst others), but fortunately this Board can act with a quorum of one member. Apart from these instances, this country has usually adopted the system of ministries and departments, administered under a single permanent head, and in recent years Northern Ireland has found it worth while to copy the same model. Board or Department—it is not the label that matters but the sympathetic intelligence which the Scottish Office will no doubt continue to supply.

INDICAN IN THE BLOOD.

In 1924 C. H. Andrewes described in our columns[1] a new colour reaction which occurred on adding van den Bergh's diazo-reagent to the serum of patients with uræmia. His observations have been confirmed by other workers, and the test has been found of use in helping to diagnose the condition of renal failure. Andrewes failed to discover the nature of the substance which gave this reaction, but recently G. A. Harrison and R. J. Bromfield have shown[2] that the colour is given by an indoxyl compound presumed to be indican, which is potassium-indoxyl-sulphate. Indoxyl is formed in the body from tryptophane, one of the principal amino-acids in the protein molecule. The amount of indoxyl which is formed depends partly on the quantity and nature of the protein which is eaten, partly on the nature of the bacterial flora of the intestines. The indoxyl which is absorbed from the intestines combines (in the liver) with sulphuric acid, and the resulting indican is then passed on into the blood. If the kidneys are functioning properly, the amount of indican circulating in the blood is very small as it is excreted in the urine. The amount in the blood depends on four factors—namely, the quantity of tryptophane in the diet, the nature of the bacterial flora, the efficiency of the liver, and the efficiency of the kidneys. It has been found that the diazo-colour reaction runs roughly parallel with the concentration of urea and creatinine in the blood of uræmic patients, although the test occasionally proves negative. F. S. Patch and I. M. Rabinowitch[3] claim that in urological cases the diazo-test enables them to judge whether the excess of urea is of serious importance or not. This claim may have to be reconsidered now that the cause of the colour reaction is known to be indican, since in spite of gross renal damage, indican may not be present in excess in the blood owing to the failure of one of the factors necessary for its formation. Harrison and Bromfield are to be congratulated on their success in elucidating the cause of a colour reaction given by so complex a fluid as blood.

A FORGOTTEN RED CROSS PIONEER.

The recent centenary celebration of the birth of Henri Dunant has stimulated the memory of Ferdinando Palasciano, surgeon to the army of the Neapolitan Bourbons, and his courageous advocacy of mercy to the wounded on the field of battle. From an account of his career by Prof. Cesare Baduel, director of the Italian Red Cross, we learn that Palasciano was early conscious of his responsibilities to soldiers, not only when they were effective combatants, but also when they were suffering and abandoned on the field of battle. At the present time it reads strange that, during the Sicilian insurrection against Bourbon rule in 1848, General Filangieri, who was besieging Messina, gave orders that no quarter was to be given to the enemy. Palasciano disregarded these orders and cared for the wounded of both sides. For this act of insubordination he was threatened with death, and he had to spend a year in prison as a reward for his clemency. Filangieri's persecution of Palasciano would doubtless have been more brutal had not King Ferdinand known him personally and valued him both as a man and as a scientist. In January, 1861, he offered to the Accademia Pontaniana at Naples a prize of 100 ducats for the best 100 rules of military surgery for the treatment of gunshot wounds. The prize was not awarded at first, but it was won some time later by Dr. Appia, of Geneva, and the Italian, De Vita. In connexion with this competition Palasciano declared before the Accademia Pontaniana that "belligerent powers, in their declaration of war, must recognise reciprocally the principle of the neutrality of the wounded and seriously ill; for the entire period of their treatment." He insisted that the principle of the neutrality of the wounded should be accepted, either by the ruling of an international congress, or by a special agreement between the belligerent powers inserted in the declaration of war. Five of his points were: (1) That the armies should be obliged to exchange wounded prisoners immediately after a battle. (2) All soldiers who were too severely wounded to be transported should be treated on the field of battle by the army's own sanitary service. (3) A sanitary staff, sufficient to care for wounded men in hostile territory, should be given a safe conduct and escort, and be allowed to remain until their task was finished, when, during a truce, the personnel could return to their own advanced post or to the frontier of the enemy's country. (4) All necessary food, lodging, and drugs should be provided by the Commissariat on the signature of the attending surgeons and on the assumption that reimbursement should be effected after the war. (5) In the case of sieges, and in addition to the exchange of the wounded, the besieged army should be allowed to send its wounded to any neutral country willing to receive them if the besieging army would not do so. In 1862 Henri Dunant published his "Souvenir de Solferino," which did so much to pave the way for the international conference of 1863. The International Convention, signed in August of the following year, neglected the fate of wounded men in naval battles. Palasciano insisted on the importance of this omission and appealed to the Italian Government to call another conference. The governments interested having come to an agreement, the Swiss Federal Council held another conference at Geneva in 1868. Palasciano did not attend it, but the amendments which he advocated to the Convention were adopted. He died on Nov. 28th, 1891, and was buried in the ground reserved for eminent men in the cemetery of Poggioreale at Naples.

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[1] The Lancet, 1924, i., 590.
[2] Biochemical Journal, 1928, xxii., 43.
[3] *Jour. Amer. Med. Assoc.*, 1928, xc., 1092.

ULTRA-VIOLET LIGHT APPLIED TO DISEASES OF THE EYE.

FROM the Ultra-violet Light Clinic, established at the Royal London Ophthalmic Hospital in the autumn of 1925, some interesting results are reported by Dr. W. S. Duke-Elder.[1] The 425 cases treated up to July, 1927, are classed into those in which general sun-baths were given and those in which the rays were applied directly to the eye. The number treated by general light baths was 306. Of these, roughly, one-third were cases of iritis and irido-cyclitis, one-third of phlyctenular keratitis, and the remainder of other diseases. The chief interest of the report lies in the cases of chronic and intractable iritis and irido-cyclitis, which have been treated without success for periods of months or years by all the known methods of therapy and which have responded well to the ray treatment. Of 76 cases of infective irido-cyclitis treated, 38, or just half, were cured, 30 showed more or less improvement, and only eight showed none. An eye, which has been the seat of active inflammation for many months, may well become quiet. On the other hand, gross structural changes are as unalterable under this as under any other treatment. Of 16 cases of choroiditis treated, the infective and the tuberculous cases did well, especially cases with persistently recurring lesions. Syphilitic cases did not respond to the treatment. Cases of scleritis and sclero-keratitis did well, and cases of phlyctenular keratitis, including extremely chronic relapsing cases, did best of all. Light may be considered almost a specific for this disease. The same may be said of obstinate blepharo-conjunctivitis occurring in debilitated patients. Duke-Elder's conclusion is that with judicious use the effects of ultra-violet light can be powerful for good, but they have their limitations and they always stop short of the marvellous. The main danger to be guarded against is over-dosage, and some patients may display an idiosyncrasy and develop symptoms of over-dosage, even while the exposures are kept well within the limits ordinarily safe. Care in this respect is especially to be insisted on in the case of patients with low blood pressure. Pyrexia is usually a contra-indication and care must be taken during menstrual periods. With regard to special effects on the skin and the eye, there is the danger of burns from excessive doses and of cataract, which must always be guarded against by the wearing of protective glasses. Direct radiation of the eye was used in 119 cases. This method involves real danger of producing cataract unless the most elaborate precautions are taken, and Duke-Elder has only employed it by means of a special ophthalmic radiation lamp, by which the desired rays are filtered off from the rest and focused accurately on the desired depth. Hence the method is only applicable for the cornea, sclera and conjunctiva, and theoretically, perhaps, with a very obliquely directed radiation, the anterior surface of the iris. Actually, of 119 cases so treated, 99 were infections of the cornea and sclerotic, 20 of varying types of conjunctivitis. All types of corneal ulcer did well, but the rays were powerless to influence the resulting scars. A few cases of hypopyon ulcer were treated, mostly along with general light baths. Phlyctenular ulcers do so well with general light baths that it is rarely necessary to employ the local treatment in addition. A few cases of chronic conjunctivitis, chronic blepharitis, and trachoma were treated with benefit. In these cases the reaction is not so easily produced as in the skin, and much longer exposures were necessary. These papers, together with the recent symposium on the subject at the Oxford Ophthalmological Congress, do much to establish the claim of ultra-violet therapy to be a new method of great promise, but they also emphasise the existence of dangers and the necessity of entrusting the administration of the remedy to specially skilled hands alone.

TRAFFIC IN NARCOTIC DRUGS.

IMPORTANT information in regard to measures for the international control of the traffic in drugs of addiction was vouchsafed in the last report made to the Council of the League of Nations by the Advisory Committee dealing with that subject. It seems probable that the Opium Convention, signed at Geneva in February, 1925, which was intended to provide a central control board and thereby strengthen Chapter III. of The Hague Opium Convention of 1912, may become operative by the end of the present year. The Convention of 1925 was the outcome of the prolonged and acrimonious "Second Conference" at Geneva in 1924–25, from which the American and Chinese delegates felt compelled to withdraw. By its articles it could not come into force until ratified by ten of the Signatory Powers, including seven of the States represented on the Council of the League of which two must have permanent seats on that body. The Advisory Committee, in its last report, stated that 15 States in all had then ratified, including four which are members of the Council, two of them, Great Britain and France, being permanent members. It is anticipated that Canada, Japan, Netherlands, Switzerland, and Roumania will shortly deposit their instruments of ratification, and thus the requisite conditions for putting the Convention of 1925 into operation will have been achieved.

It is hoped by the Advisory Committee that when the Central Control Board, as provided by the Convention is set up, the highly unsatisfactory position of the illicit traffic in dangerous drugs, described as "enormous," will be checked. The report states that—

> "the seizures effected in various countries, particularly in the Far East, still represent considerable quantities; a return—incomplete owing to the inaccuracy of the figures given for certain seizures and relating to a period of about 18 months—shows the striking figures of 2320 kilogrammes for cocaine, 1600 kilogrammes for morphine, and 1150 kilogrammes for heroin, quite apart from a considerable number of seizures of which no precise details are given, but which represent totals perhaps as large as those given above. Moreover, it must not be forgotten that the largest proportion of the narcotics illicitly distributed escapes seizure."

The Committee are at a loss to know the sources from which the illicit traffickers draw their supplies of morphine and of the opium from which the alkaloid is derived.

It will be remembered that M. Zahle, the President of the Conference which drafted the Geneva Convention of 1925, stated that:—

> "if manufacture and transit (of drugs) have been well cared for, the same cannot be claimed for production. The American principle for a limitation of production to medical and scientific purposes, though accepted as a principle by the Advisory Committee on the traffic in opium and the Assembly, has not been included in the Convention as a contractual obligation," and "similarly only a limited progress can be claimed as regards the smoking of opium in certain Pacific countries."

It was omission to deal adequately with these aspects of the problem that led to the withdrawal from the Geneva Conference of the American and Chinese delegates, since they regarded the new agreements as derogating from the spirit and true intent of The Hague Opium Convention of 1912. While it is to be hoped that the expectations of the Advisory Committee, based on the coming into operation of the exclude the technical expert in health, housing, or agriculture? The Scottish Members of Parliament who object to the Bill have pointed out that there is no allegation of existing inefficiency; they have specially praised the administration of the boards which deal with health, agriculture, and prisons: they maintain that the proposals mean the denationalisation of Scotland and will hasten the advent of home rule. On this wider issue of autonomy and national sentiment Scotland will find support from the Welsh Members of Parliament who have lately been protesting against the proposed reorganisation of the Welsh Board of Health. To the latter the Minister of Health has replied that the abolition of a chairman and the reduction of the Welsh Board from four to three members is not part of a policy of denationalisation; the Board has not been an executive body; it has met not more than 28 times in the past nine years; its work is done by individual members in their individual capacities; the present change is a matter of internal administration only, a question of personal arrangements. This question of personal arrangements arises also in the Scottish proposals. The existence or the near prospect of certain vacancies has caused the administrative changes to be pressed forward now at a moment when they can most smoothly be effected. Sir John Gilmour appears to have given some kind of assurance that he will hold himself as accessible to his technical advisers as heretofore, though he frankly maintains that experts must be controlled. We do not, he observed, allow the military and naval experts to carry out all they desire. Similarly, "if the medical man had his way, he might possibly impose upon Parliament and the country a system eminently desirable no doubt but so extravagant or so much in advance of the time that Parliament could not tolerate it." Sir John Gilmour's best argument is that every inquiry and commission which has examined the science of administration has recommended the change he proposes. England has a Board of Admiralty and a Board of Inland Revenue; she has a Board of Trade (of which the Archbishop of Canterbury is a member amongst others), but fortunately this Board can act with a quorum of one member. Apart from these instances, this country has usually adopted the system of ministries and departments, administered under a single permanent head, and in recent years Northern Ireland has found it worth while to copy the same model. Board or Department—it is not the label that matters but the sympathetic intelligence which the Scottish Office will no doubt continue to supply.

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[1] British Journal of Ophthalmology, June and July, 1928.

INDICAN IN THE BLOOD.

IN 1924 C. H. Andrewes described in our columns[1] a new colour reaction which occurred on adding van den Bergh's diazo-reagent to the serum of patients with uræmia. His observations have been confirmed by other workers, and the test has been found of use in helping to diagnose the condition of renal failure. Andrewes failed to discover the nature of the substance which gave this reaction, but recently G. A. Harrison and R. J. Bromfield have shown[2] that the colour is given by an indoxyl compound presumed to be indican, which is potassium-indoxyl-sulphate. Indoxyl is formed in the body from tryptophane, one of the principal amino-acids in the protein molecule. The amount of indoxyl which is formed depends partly on the quantity and nature of the protein which is eaten, partly on the nature of the bacterial flora of the intestines. The indoxyl which is absorbed from the intestines combines (in the liver) with sulphuric acid, and the resulting indican is then passed on into the blood. If the kidneys are functioning properly, the amount of indican circulating in the blood is very small as it is excreted in the urine. The amount in the blood depends on four factors—namely, the quantity of tryptophane in the diet, the nature of the bacterial flora, the efficiency of the liver, and the efficiency of the kidneys. It has been found that the diazo-colour reaction runs roughly parallel with the concentration of urea and creatinine in the blood of uræmic patients, although the test occasionally proves negative. F. S. Patch and I. M. Rabinowitch[3] claim that in urological cases the diazo-test enables them to judge whether the excess of urea is of serious importance or not. This claim may have to be reconsidered now that the cause of the colour reaction is known to be indican, since in spite of gross renal damage, indican may not be present in excess in the blood owing to the failure of one of the factors necessary for its formation. Harrison and Bromfield are to be congratulated on their success in elucidating the cause of a colour reaction given by so complex a fluid as blood.

A FORGOTTEN RED CROSS PIONEER.

THE recent centenary celebration of the birth of Henri Dunant has stimulated the memory of Ferdinando Palasciano, surgeon to the army of the Neapolitan Bourbons, and his courageous advocacy of mercy to the wounded on the field of battle. From an account of his career by Prof. Cesare Baduel, director of the Italian Red Cross, we learn that Palasciano was early conscious of his responsibilities to soldiers, not only when they were effective combatants, but also when they were suffering and abandoned on the field of battle. At the present time it reads strange that, during the Sicilian insurrection against Bourbon rule in 1848, General Filangieri, who was besieging Messina, gave orders that no quarter was to be given to the enemy. Palasciano disregarded these orders and cared for the wounded of both sides. For this act of insubordination he was threatened with death, and he had to spend a year in prison as a reward for his clemency. Filangieri's persecution of Palasciano would doubtless have been more brutal had not King Ferdinand known him personally and valued him both as a man and as a scientist. In January, 1861, he offered to the Accademia Pontaniana at Naples a prize of 100 ducats for the best 100 rules of military surgery for the treatment of gunshot wounds. The prize was not awarded at first, but it was won some time later by Dr. Appia, of Geneva, and the Italian, De Vita. In connexion with this competition Palasciano declared before the Accademia Pontaniana that "belligerent powers, in their declaration of war, must recognise reciprocally the principle of the neutrality of the wounded and seriously ill, for the entire period of their treatment." He insisted that the principle of the neutrality of the wounded should be accepted, either by the ruling of an international congress, or by a special agreement between the belligerent powers inserted in the declaration of war. Five of his points were: (1) That the armies should be obliged to exchange wounded prisoners immediately after a battle. (2) All soldiers who were too severely wounded to be transported should be treated on the field of battle by the army's own sanitary service. (3) A sanitary staff, sufficient to care for wounded men in hostile territory, should be given a safe conduct and escort, and be allowed to remain until their task was finished, when, during a truce, the personnel could return to their own advanced post or to the frontier of the enemy's country. (4) All necessary food, lodging, and drugs should be provided by the Commissariat on the signature of the attending surgeons and on the assumption that reimbursement should be effected after the war. (5) In the case of sieges, and in addition to the exchange of the wounded, the besieged army should be allowed to send its wounded to any neutral country willing to receive them if the besieging army would not do so. In 1862 Henri Dunant published his "Souvenir de Solferino," which did so much to pave the way for the international conference of 1863. The International Convention, signed in August of the following year, neglected the fate of the fixation of dropped organs and for closing defects in the dura mater, and it can even be grafted into a hole in the wall of a hollow viscus. In some of these operations success is the rule, but in others it cannot be assured as yet. Further study will determine the conditions essential for a favourable outcome; nevertheless, much knowledge has already been gained, and the way has been pointed out for future inquiry into a method which has already proved to be a valuable asset in the hands of the general surgeon.

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[1] THE LANCET, 1924, i., 590.

[2] Biochemical Journal, 1928, xxii., 43.

[3] Jour. Amer. Med. Assoc., 1928, xc., 1092.

HEALTH CONGRESS AT PLYMOUTH.

SOME 850 delegates, including representatives of the Home Government, the Governments of India and the Dominions and of foreign countries, and a large number of members, making up a total of about 1500 persons, have assembled for the thirty-ninth Congress of the Royal Sanitary Institute, which bids fair to equal in success any of its predecessors. The Bishop of Plymouth preached at a special service in St. Andrew's Church on Sunday morning and the Rev. T. Wilkinson Riddle at George-street Baptist Chapel in the evening. On Monday the members and delegates were welcomed by the Mayor (Councillor W. H. J. Priest), who later opened the Health Exhibition at the Drill Hall. At 5 P.M. the inaugural meeting of the Congress was held in the Guildhall, when Prof. Bostock Hill, chairman of the council, in inducting the President, the Right Hon. Viscount Astor, referred to the many outstanding services which he had rendered to the advancement of hygiene, notably with respect to the fight against tuberculosis, the improvement of the milk-supply, and maternity and child welfare. Lord Astor's presidential address was an extremely interesting survey of the whole problem, but was much more in that it contained many suggestions and expressions of opinion likely to stimulate discussion when the meetings of the sections and conferences take place. Parliament, he said, had tackled the smoke nuisance in a timid manner, and he hoped some day they would be bold enough to deal with the domestic chimney. Our greater use of water might make it necessary to appoint, even at this late period, conservancy boards for all our rivers. He deplored the effect on birds and possibly on fish from the pollution of the sea by oil from ships. He hoped the time was not distant when the buyer would know whether he was buying raw or pasteurised, clean or dirty milk. He welcomed the more important status given to veterinary hygiene. He referred to the great benefit likely to accrue to industrial hygiene from the work of the International Labour Office at Geneva, the first section of the League of Nation's headquarters to become a going concern. After referring to the lamentably high maternal mortality and morbidity from childbirth, he expressed his views on the right and the wrong kinds of birth control. In urging the imperative need for the preservation of the beauty of the countryside, he suggested that local authorities should plan for new villages and try to keep the intervening spaces open. Practical schemes were possible by which owners of land deprived of building value could be compensated from the increased value of land that is developed. He expressed his disapproval of the recent proposal for the compulsory detention and treatment of men and women suffering from venereal disease. Regulations based on a low conception of human morality could not accelerate physical or moral progress. His concluding note was on the interrelationship of rest, harmony, and health, and a plea for a daily brief period of rejuvenating peace and constructive silence to counteract the excessive restlessness of modern existence. In moving a vote of thanks to Lord Astor, Mr. Ramsay MacDonald referred to the last portion of the address as "crammed full of shining wisdom." In this period of extraordinary evolution of science and power, it was very necessary that there should be some guiding principles, and that we should take stock and "consider the end of it all."

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TREATMENT OF ACUTE AND CHRONIC LARYNGITIS.

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Acute Laryngitis in Adults.

The treatment of acute laryngitis in adults presents a somewhat different problem from the treatment of a similar condition in infants. The adult patient should be kept in an even temperature, preferably in bed, and should be encouraged to drink large quantities of warm fluids. He may be given drugs to promote perspiration and to ensure rest—for example, aspirin grs. x., Dover's powder grs. viii. at night. Inhalations of steam impregnated with tinct. benzoin co., pine oil, or eucalyptus oil, every three or four hours for a quarter of an hour will be most useful. Abstinence from alcohol and smoking should be enjoined. Rest of the voice is important. Should cough be a prominent symptom a mixture containing small doses of heroin may be given. The attack usually subsides in a few days; the voice becomes normal, cough and secretion disappear. In rare cases œdema of the tissues over the arytenoid cartilages and of the aryepiglottic folds occurs. This results in dyspnœa of variable degree; it may be so severe as to demand tracheotomy. Should such a complication occur it is well to give antistreptococcal serum (25 c.cm.) subcutaneously, and a further dose the next day. Scarification of the œdematous areas has been advocated.

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Owing to the relatively small glottis, acute laryngitis in infants is apt to be more serious than in adults. Inspiratory obstruction is especially to be feared. It is essential to exclude diphtheria as the cause in a case of acute laryngitis. Diphtheria of the larynx is almost invariably accompanied by diphtheria of the pharynx, and will show itself by the presence of the typical greyish-white membrane on the tonsils and on the anterior pillars of the fauces or uvula; in all cases of doubt swabs should be taken from the pharynx. If the clinical examination give rise even to suspicion of diphtheria, the case must be given the appropriate dose of antidiphtheritic serum—for a child of 6, 8000 units, for a child of 12, 10,000 units—without waiting for the bacteriological report.

The general principles of the treatment outlined above must be adhered to for catarrhal laryngitis. Rest in bed in an even temperature is important, and since the child may not be able to inhale, a steam kettle should be used. Perhaps the most useful drug for children is chloral. It is of value mainly in ensuring rest, physical and mental, and in allaying the alarm that stridor produces; often merely keeping a child drowsy will enable tracheotomy to be avoided. Inhalation of oxygen through a nasal tube will be helpful. On the other hand, tracheotomy must not be too long postponed, since the child's heart will not tolerate too long the strain of dyspnœa; the patient's colour, the amount of "sucking-in," and the pulse must be considered in deciding on the necessity for tracheotomy or intubation.

Another disease that may be mistaken for laryngitis is laryngismus stridulus; this condition is one seen in rickety children, often associated with adenoids; attacks come on suddenly, generally

1925 Convention, may be realised, the larger question of the production of the raw material of the drugs in question remains to be dealt with, and is complicated by the fact that such producing countries as Turkey and Russia are outside the League, while other producing countries like Persia,[1] Greece, Bolivia, and Peru have not seen their way to supply the information asked for by the Committee.

FRONTIER NURSING IN KENTUCKY.

THE pages of THE LANCET open to-day with an address which Sir Leslie Mackenzie, until recently the Medical Member of the Scottish Board of Health, delivered in circumstances of wide medical importance, as well as of personal interest to the orator. The occasion was the dedication of a hospital and nursing centre, established by the Frontier Nursing Service of Kentucky in the eastern and mountainous regions of the State. The hospital is to serve as a main focus in an organisation for the prevention of disease and the maintenance and promotion of health in certain thinly peopled areas, which present a great similarity to the Highlands and Islands of Scotland in respect of the conditions which have to be met in providing medical service. And while the problems are similar, the methods of dealing with them are also similar, for the excellent reason that Mrs. Mary Breckinridge, the inspiring pioneer of the American work, commenced her task with a personal investigation in Scotland of the way in which the State and individual workers had dealt with the difficulties of the medical service in the Highlands and Islands. This Scottish area, as defined by statute, has a population of but 320,000 scattered over 10 million acres, either isolated by the sea or intersected by mountains and rivers which are impassable in many seasonal conditions. It is true that there is no marine peril connected with the medical service in Kentucky, but the mountains and rivers are there, and so are the scanty and poor inhabitants; and those responsible for the Scottish work may well be proud that their labours have found echo in the far West. We may hope that the activities in America will be attended with less practical difficulties than were those in Scotland through many long years of effort. The difficulties of transport and the needs of the two populations, though varying in detail, may be the same in significance, but the problems present in the scattered regions of the north of Scotland were much complicated by historic, racial and social differences which made any processes of amalgamation, for any purpose however worthy, extremely difficult of accomplishment. These things Sir Leslie Mackenzie sets out with the eloquence of one who not only was the leading spirit in dealing with them, but was born in the middle of them and knows their reality. Because of his intimate and personal knowledge both of the plight in which his humbler fellow-countrymen were, and of the great qualities demanded of those who undertook to minister to their medical needs, Sir Leslie, throughout his whole official career was a valuable servant of the State, of humanity, and of his calling. Therefore, he takes with him into retirement the thanks of all for what he has done, something of which is indicated modestly in his message to the Frontier Nursing Service of Kentucky.

THE MODERN VIEW OF EPILEPSY.

SUPERFICIAL observers are apt to remark that in spite of a vast amount of research we are as far as ever from understanding the cause of epilepsy. Those, however, who have personal experience of research in this disease know that such a statement betokens a lack of appreciation of the nature of the problem to be solved and hence of the means by which its solution will be accomplished. A military metaphor may here prove illuminating. In trench warfare an advance by one side can only occur after the preparation of vast quantities of munitions and a barrage by which the enemy's defences are broken down, but during this essential preliminary stage the position of the combatant lines remains unchanged. In the assault on epilepsy there is reason to hope that we are witnessing the preparatory barrage, and that though the lines at present remain stationary, much valuable work is being accomplished which is an essential preliminary to a true advance of knowledge. Reflections such as these are provoked by Dr. W. G. Lennox and Dr. Stanley Cobb's admirable review [1] of recent work on the condition. The authors confine themselves to the consideration of the mechanism involved in seizures, and the cause and treatment of epilepsy, rightly emphasising at the outset that epilepsy is a symptom and not itself a disease. The various physiological theories of the nature of a convulsion are critically examined, and the conclusion reached that no single theory can hold the field to the exclusion of the others. Considerable space is devoted to the pathological changes in the brain and elsewhere, which have been held to be related to epilepsy, but little stress is laid upon these. Much recent investigation of epilepsy has been biochemical, and about one-third of the review is a survey of this field, dealing especially with the significance of disturbances of acid-base equilibrium. Treatment is discussed, including starvation and a ketogenic diet. The number of references quoted is about 500, and Dr. Lennox and Dr. Cobb bring to bear upon this mass of material a judgment which is both critical and constructive, being based upon a wide personal experience of the clinical, experimental, and biochemical investigation of epilepsy. Their conclusion may be summarised in their own words, "the hope for an understanding of convulsions lies in a knowledge of the factors which affect the reactive capacity of nerve cells," and it is the multiplicity of such factors which renders the problem of epilepsy so complex and necessitates many and varied modes of approach. They are to be congratulated upon a work which will be a necessity to investigators of convulsive states and of practical value to all who have to deal with epileptic patients.

FASCIAL GRAFTING.

THE laws governing the transplantation of tissues are more or less known; it has been proved over and over again that grafting of fibrous tissue, if infection be prevented, is almost certain to be a success. But this knowledge does not seem to have been exploited to the degree its importance warrants. How far-reaching is the use of fascial grafting methods is brought home to the reader of two recent books, by Dr. Ernst König,[2] in Germany, and by Mr. H. C. Orrin,[3] in this country. In human surgery the fascial investment of the thigh has been chiefly used. It is convenient to obtain, and its removal does not lead to any detectable disability; it is of different thicknesses in its different parts, and is thus suited to various purposes; it can get its nourishment from the tissue juices which exude from the bed in which it is placed; it heals in and maintains its own proper structure; it does not shrink, and when subjected to strain it increases in strength. A simple enumeration of the uses to which it has been put will show how many and diverse are the conditions amenable to treatment by fascial grafting. Defects in tendons can be remedied in a way possible with no material which does not become an integral part of the organism; tendon sheaths can be replaced, and deformity resulting from a paralysed muscle can often be in part overcome by a transplant. Fascia can be used as a covering for the ends of bones in an arthroplasty or for winding round a nerve after suture; it is the best material for closing the aperture through which a large hernia has come; it has been used for the fixation of dropped organs and for closing defects in the dura mater, and it can even be grafted into a hole in the wall of a hollow viscus. In some of these operations success is the rule, but in others it cannot be assured as yet. Further study will determine the conditions essential for a favourable outcome; nevertheless, much knowledge has already been gained, and the way has been pointed out for future inquiry into a method which has already proved to be a valuable asset in the hands of the general surgeon.

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[1] See THE LANCET, 1928, i., 457.

[1] Medicine, vol. vii., No. 2, May, 1928. Williams and Wilkins Company, Baltimore. (London agents: Baillière, Tindall and Cox, 8, Henrietta-street, W.C.)

[2] Die körpereigene freie Fascien-Verplanzung. 1928. Berlin: Urban and Schwarzenberg. Pp. 302. M.20.

[3] *Fascial Grafting in Principle and Practice.* 1928. Edinburgh: Oliver and Boyd. Pp. 92. 7s. 6d.

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Another disease that may be mistaken for laryngitis is laryngismus stridulus; this condition is one seen in rickety children, often associated with adenoids; attacks come on suddenly, generally at night, when the child wakes in distress with inspiratory crowing. The history of previous attacks, the absence of local pharyngeal signs of inflammation, and the type of child will help in arriving at a diagnosis. Retropharyngeal abscess, especially if low down at the level of the epiglottis, gives rise to dyspnœa; inspection with a good light from a forehead mirror or better, palpation with the finger will reveal a swelling of the pharyngeal wall and decide the diagnosis.

Recurrent Cases.

Should acute catarrhal laryngitis recur, predisposing factors must be sought in the upper respiratory tract and, if possible, removed. Any cause of nasal obstruction, especially a deflected septum, large middle turbinals or adenoids should be excluded; also foci of infection, suppuration in the accessory nasal sinuses, and inflamed adenoids or tonsils.

Chronic Laryngitis.

Chronic laryngitis may be the result of attacks of acute laryngitis; in this case it is all the more important to search for and remove the predisposing causes enumerated above. Treatment of the condition itself is partly general and partly local. Rest of the voice is essential. Faulty methods of voice production in singers or speakers should be corrected, and abstinence from alcohol and tobacco enjoined. A mixture containing potassium iodid grs. iii., pot. nitrate grs. x., oxymel ʒii., tinc. camp. co. ♏xxx., and extract ipecacuanha liq. ♏i. is useful. Locally, in established cases, painting the cords with a solution of zinc chloride (grs. xv. or grs. xx. to ʒi.) daily might be tried. In all cases of chronic laryngitis it is essential to exclude the possibility of tubercle by expert examination of the chest and sputum.

Syphilis as a cause must be excluded by a Wassermann test.

Atrophic Rhinitis.—There are one or two varieties of chronic laryngitis which call for special treatment—for example, that due to or secondary to atrophic rhinitis. Even vigorous treatment of the nose, set out below, may fail to cure the laryngeal disease, but should be patiently undertaken; the nose is to be syringed twice daily by means of a Higginson's syringe with a pint of normal saline, to which is added ℥ss. of carbolic acid 1 in 20—this will wash away crusts and keep the nasal passages clean.

Singer's nodules consist of small projections from the edges of the vocal cords at the junction of the anterior and middle thirds. Over-use or mis-use of the voice may be the cause, and must therefore be corrected. Failing this the nodes may be touched with the galvano cautery; this can be done by means of a specially shaped cautery point after painting the larynx with cocaine.

Pachydermia laryngis is a very resistant form of chronic laryngitis, in which there are projections in the posterior commissure or posterior parts of the cords. Removal of these projections has been practised in various ways with poor result. Recently, however, a degree of success has been obtained by the judicious use of diathermy (Kisch); under chloroform anæsthesia two or three punctures are made into the projections with a fine diathermy needle, and very considerable improvement has followed.

Tuberculous laryngitis is always a serious complication of phthisis, and the prognosis grave. Strict silence over a period up to three months will cure slight cases, when combined with general open-air treatment. More serious advanced cases may be arrested by the same means. Should the lung affection clear up local treatment of laryngeal swellings by galvano-cautery puncture under local anæsthesia is very useful. Advanced cases, in which pain is the prominent symptom, must be treated symptomatically by means of local insufflation of orthoform and anæsthesia.

W. M. MOLLISON, C.B.E., M.Chir.,
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Special Articles.

ON THE NEED FOR STANDARDISATION IN CLINICAL PATHOLOGY.

The Opening Address to the Association of British Pathologists.

BY SIR THOMAS HORDER, BART., M.D. LOND.

DOUBT has been expressed in certain quarters as to the need for this Association. I have myself no doubts whatever on this score. In every branch of medicine there must of necessity be an academic side and a practical side. In anatomy, in physiology, in physics, in chemistry, there are men working out particular problems of an academic kind which, though they have a possible bearing, direct or indirect, upon the diagnosis and the treatment of disease, yet are conceived in a purely academic spirit and are pursued for their own sake and not as direct aids to the prevention or the cure of disease. It is so also in pathology. I suppose we are all members of the Pathological Society of Great Britain and Ireland, and are interested in the more abstruse problems that chiefly form the business of that body. But the doctor in charge of the patient could get very little pathological help in the conduct of his cases were he dependent directly upon the activities of that Society, however energetic these may be. There needs a special acquaintance with the particular aspects of disease, and experience of the material derived from the patient and how best to deal with it, in order to supply that important information which supplements clinical medicine and makes it a whole, rather than a part, of the disease-picture. Clinical pathology requires that the objectives constantly kept in mind are the diagnosis and the treatment of the diseased patient. Here, too, time is the essence of the contract. Pure research may be followed leisurely; indeed, to follow it in any other way than deliberately and slowly is to invite failure. Clinical pathology demands promptness and concentration towards an immediate practical end; the individual's health, perhaps life, is at stake, and this puts a limit to contemplativeness and abstraction. It is the application of pathological principles to practical medicine—it is not the discovery of those principles themselves—that we are concerned with.

The Unity of Pathology.

As to the importance of clinical pathology in our work as doctors it is no longer necessary to emphasise this. Time was when it was very necessary, and I am pleased to think that insistence upon the fact that the recent developments of medicine have been very largely in the direction of examining materials derived from the patient, rather than examination of the patient himself, is the fact to which I owe the honour of addressing you. This insistence, and the equal emphasis put upon the importance of preventing a divorce between pathology and clinical medicine, cover most of the small contributions which I personally can claim towards the progress of our science and art.

You will see, therefore, how reasonable it is that I should welcome the formation of this particular Association, consisting as it does of a body of men whose work lies very largely in this direction and—I speak quite deliberately—whose livelihood depends upon the important contributions made by them in their routine occupation towards the elucidation of the problem of the patient's disease and his treatment. I am quite certain that the Society has a great field, and I predict for it a very successful future.

Inasmuch as we are really all of us both clinicians *and* pathologists in spirit, though not in deed, I want to say a few things concerning matters that affect both sides of that science which we study from two different angles. I refer to the science of Pathology. For it must not be forgotten that Pathology remains the science of disease, and to study it without coming a great deal into contact with the patient in whom the disease is being expressed, is to deal with only one set of data and to leave an equally important set unconsidered. I like to preach the unity of pathological processes, because there are still some who speak and act as though the whole thing can be seen and dealt with, either in the laboratory or at the bedside, whereas it requires a study of both aspects of the problem to achieve a satisfactory view.

The Doctor's Brief to the Pathologist.

For this reason it is of great importance that you should get as full a brief as possible from the doctor *concerning the clinical features* of the case in which help is asked. For the present unsatisfactory position in regard to this desideratum both parties are a little to blame. One fact which tends to obstruct this very necessary liaison is the existence of laboratories in which the personal element as between doctor and pathologist is quite eliminated. Materials are dumped in these places much as coals are dumped at our houses. I supposed such places are necessary ; anyway they seem to have come to stay. I do not patronise them myself, because I am fortunate enough to be in frequent daily touch with colleagues working in pathological laboratories. But I am quite convinced, even apart from such facilities as I and all of us in large centres possess, that the commercialising of this part of our work is as bad for the patient and for us as it would be if clinical medicine were itself commercialised. When this matter is considered by the Association it might be well to hear the views of some practitioners. There is, by the way, another matter of policy which I suppose you will be discussing, and that is the vexed question of the supply of such therapeutic agents as vaccines from hospital centres. This is a large subject, and merits very full consideration before taking up a definite position. But I have no doubt that the Council, and the Association generally, realises the great importance of maintaining all the best traditions of our profession, and that they can be trusted to do this in connexion with these and with allied matters.

Again and again we see the futility of pathological work, and conclusions drawn from this, when it is a thing quite detached from the clinical aspects of the case. We are so familiar with this fact that to quote instances is superfluous. Recently a patient brought me her blood report. After detailing the figures and certain other observations the report stated that "this is most probably an anæmia of the Addisonian type in spite of the high Hb and low C.I. This group comprises P.A., sprue, and bothriocephalus anæmia. The eosinophilia, consisting of young eosinophils, makes the diagnosis of the last named tempting, though unlikely." Now as a matter of fact the patient had had her spleen removed six months ago, and was, at the time of this count, suffering from a severe attack of urticaria. Both of these facts were, of course, of the utmost significance, and in face of them the valiant efforts at explaining the blood picture became pathetically ludicrous when one saw the patient—a plethoric-looking woman with a red face, who has never been out of England.

This struggle to get farther than the data of the examination admit should be resisted, whether it be as regards diagnosis, or prognosis, or treatment. And since I have embarked upon the matter of pathological reports, with which, after all, my contact with clinical pathology is chiefly concerned in these days, I may as well say a few more things about them now they are in my mind.

The Logic of the Report.

It cannot too often be iterated that no amount of negative investigations ever establishes a positive diagnosis. At the most a negative report gives presumptive evidence against a certain condition or disease. In simple cases such as (say) the absence of a demonstration of T.B. in sputa, or of gonococci in urethral pus, we know how illogical it is to conclude that phthisis or gonorrhœa, respectively, is not present. Yet a more illogical conclusion is now and again perpetrated in the face of a set of negative data, more illogical because the tests conducted are relative tests and not absolute ones. I have more than once drawn attention to the occurrence of well-marked cases of typhoid and paratyphoid in which agglutinations are completely absent, and where the pathologist reports that this negative point excludes these diseases. Of course this is not so. But it not seldom happens that blood cultures, urine cultures, and even stool cultures also prove negative in such cases. When this is so, even pathologists of great experience are prone to consider themselves justified in excluding this group of infections, thus contravening a logical principle of a most primitive kind. The explanation of these cases is not at present forthcoming. It looks as though the present technique, thorough though it is, is not quite suited to them in some way. However this may be, I do, and not at all infrequently, see cases in which the clinical evidence of typhoid or paratyphoid—and I am often unable on clinical grounds to distinguish these infections with any degree of certainty—is quite indisputable ; a definite incubation period, an ingravescent pyrexia, a relatively infrequent pulse-ratio, headache, epistaxis, enlarged spleen, leucopenia, patulous belly, rose-spots, defervescence by lysis, and even one or two relapses ; *yet the serum agglutination*, and the most careful blood and stool cultures, may fail to yield any positive data. I have at home two pathological reports concerning such cases in which the sentence occurs : "Whatever this disease is, it is not in the T.A.B. group."

I am speaking on this point rather fully because it illustrates a principle to which I want to draw attention. There is in the minds of some pathologists an idea, never perhaps so baldly defined as I am now defining it, yet receiving frequent practical application, that facts ascertained in the laboratory have a different and a more trustworthy value than facts ascertained at the bedside. This seems to me to indicate lack of clear thinking. If a fact be clearly established it matters not in which sphere of observation it is found ; nothing can make it less, or more, a fact. We all realise, of course, that the clinical expressions of disease are more difficult to interpret than those revealing themselves to the more exact methods of the laboratory, but there are fallacies of a special kind in laboratory work, and there is need for forbearance in the use of the microscope and the test-tube, just as much as there is in the use of clinical methods. In the last resort we are all reduced to the exercise of our own judgment and our reason, and we are all equally prone to fall victims to authority and our own preconceived ideas. In proportion as we do fall victims to these things the complexities of disease are certain, sooner or later, to humiliate us, and bring us back to fundamental principles.

The Final Test is the Patient.

What is the final test in all such difficulties of reasoning and experience ? It must be the patient, of course, and what eventually happens to him. And only by maintaining a close liaison between clinical medicine and pathology can these doubts be settled. We are familiar with the expression "pathology as a help to clinical medicine." I was once bold enough to read a paper upon "Clinical Medicine as a Help to Pathology," and I should still like to commend this thought to the members of the British Pathologists' Association. There are still not enough consultations between clinicians and pathologists, and this refers both to hospital and to private practice. The bedrock of our work is the post-mortem room. It is there that our vanities get the shocks that are so good for them, but it is also there, I am glad to say, that our efforts get their best encouragement. We should see to it

Canada.—Dr. E. Gendreau (Montreal); Dr. Duncan Graham (Toronto); Dr. G. E. Richards (Toronto); Dr. Harold W. Wookey (Toronto).

India.—Prof. R. B. R. N. Bhatia (Lucknow); Maj.-Gen. B. H. Deare (Calcutta); Dr. H. M. Masina (Bombay); Mrs. R. Young (Delhi).

New Zealand.—Dr. Andrew Muir Begg (Otago); the Hon. W E. Collins (New Zealand).

Singapore.—Dr. J. C. Tull (King Edward VII College).

South Africa.—Dr. R. B. Denison (Univ. of South Africa); Dr. C. Louis Leipoldt (Univ. of Capetown); Mr. W. Welchman (Univ. of the Witwatersrand).

The King's Reply to the Address.

In the course of his reply to the address presented by Sir John Bland-Sutton, His Majesty said:—

"I note, with interest, that your object is research both into the cure and causes of cancer. No doubt, in the last resort, the discovery of the cause is the only certain and absolute means of cure. But I am glad that you have not ignored the practical side of the problem. Remembering the thousands of sufferers from cancer, I feel that if your discussions lead to advance in diagnosis, treatment, or even palliation of the disease, this Conference will have justified itself and earned the gratitude of mankind."

TUESDAY, JULY 17TH.

At the Royal Society of Medicine on Tuesday morning the **SECRETARY** read a letter of welcome from H.R.H. the Duke of York, and Sir **JOHN BLAND-SUTTON**, the President, said that students of nature recognised in the animal kingdom an innate rhythm which caused bees to swarm and animals to congregate. This rhythm had brought together to-day a hive of able men, all interested in a disease which, according to the lay press, threatened to exterminate civilisation. Out of this world-wide swarming of experts Sir John hoped that some valuable help would come. He welcomed especially the delegates who had come long distances and from overseas to assist in the conquest of cancer.

Lord **DAWSON OF PENN** presided at the discussion on

THE ÆTIOLOGY OF CANCER,

and emphasised the magnitude of the problem and the patience necessary for even the smallest advance. The discussion was opened by Prof. J. **EWING** (New York), who pointed out that two distinct problems must be considered: the exciting factor or causal genesis and the nature of the tumour process or formal genesis. Knowledge of the former was comprehensive and at times almost final, and the knowledge had proved fruitful both practically and theoretically. The other problem had made little progress, despite the modern weapons of biology, biophysics, and biochemistry; it seemed to await substantial advances in general science. The problems of the nature of cancer and of growth in general were probably identical. The exciting factors acted with predisposing causes, of which chronic irritation of any kind was the most significant. Some irritants excited a slowly progressive process which might not reach the stage of cancer for many years, and minute amounts might be sufficient. Bacterial causes were less well-defined than chemical and mechanical, but the process excited by the tubercle bacillus, might progress of its own momentum and gradually acquire neoplastic properties with complete elimination of the bacillus. Precancerous changes showed every transition stage from normal inflammatory to neoplastic overgrowth, strongly suggesting that the forces at work were merely the intrinsic powers of the cell. The changes were not, however, invariably present. The factors predisposing to irritation were tissue abnormalities and heredity. The idea of dedifferentiation of adult cells was unwarranted, and Hannsemann's conception of anaplasia was more applicable to malignant cells. The hereditary element seemed to be dominant in some forms of cancer and recessive in others, and was a structural or physiological peculiarity of the organs predisposing them to cancerous reaction.

The best explanation of malignant growth was the theory of cell autonomy, but this did not account for the persistent growth over long periods and the capacity for independent existence in metastases. The soundest field of modern research dealt with growth-stimulating substances in embryonic and tumour tissue.

Cancer a Multiple Disease.

The theory of a universal cancer parasite must be ruled out for lack of evidence, but micro-organisms might act as irritants. General physiology might throw more light on cancer than the detailed biochemical processes. That malignant growth was always essentially the same in its physical, chemical, and physiological relations was an unwarranted assumption, and studies aiming to solve the whole problem at one stroke were destined to fail.

Dr. F. **BLUMENTHAL** (Berlin) said that the cancer cell was a cell with new chemical properties which differed only quantitatively and not qualitatively from those of normal and embryonic cells. The totality of these changes led to the specific capacity of transmitting these properties to their posterity. Cancer stimuli proceeded by way of an inflammatory stage with increased cell division and regenerative processes; after this stage the cancer cell acted autonomously without stimulus. The stimulus could not be a universal cancer producer. Special and incidental cancer parasites were only significant in the pre-cancerous stage, and then only if they displayed a definite metabolism or acted as carriers of a cancer agent. This agent was probably a cellular product which, on the decay of cancer cells, was taken up by macrophages, so that they became cancer cells or transmitted the agent to others. This agent was therefore infective and could adhere to parasites inside the tumours and penetrate into healthy cells. It might be something like the bacteriophage; it might be a catalyst or an enzyme. Perhaps it originated in the monocytes in the spleen.

Prof. A. **LEITCH** (London) said that a similar tumour might be produced by quite dissimilar substances, and very dissimilar tumours might be produced by one agent. Experimental tumour production was always a slow process; it was not the age of the subject that mattered but the time of exposure to the noxious agent. In the early stages no morphological change could be detected, but the cell undergoing cancerisation might be said to be "accumulating growth substance." Some adult cells had entirely lost their growth substance; they could not regenerate and never formed tumours, but the majority retained a certain amount, and under sufficient stimulus the regeneration reaction passed into proliferation. Gye's claim to have isolated this growth substance as a virus could no longer be upheld, but it was possible to induce the filterable fowl tumour in the absence of a virus, and herein lay hope of future developments. This tumour was near enough to a sarcoma to suggest that the "growth substance" might be within the range of experimental investigation.

Dr. A. **BORREL** (Strasbourg) gave a lantern demonstration of his method of studying cancer cells in cover-glass cultivations stained by the methods used for ultra-microscopic viruses. They showed a remarkable density of coloration and development of the mitochondrial threads, filaments. and straight rods, sinking into an indefinite stained granulation spot which might be a symbiotic microbial spot. Between the cells were sometimes seen granulations like those of molluscum contagiosum. All the cancers resulting from parasites, scalds, X rays, syphilitic lesions, &c., appeared in a cellular system which he called the neuro-tropho-pigmentary system, in which all the parasites concerned lived and grew. The "cancer age" corresponded with the whitening of the hair, when the system became a phagocytic system causing the sclerosis and degeneration of old age. All the predisposing causes of cancer had an elective irritant action on the tropho-pigmentary system.

Prof. H. T. Deelman (Groningen) described the post-mortem findings in a patient who had died of pneumonia with a cancer of the pharynx appearing two years after operation for buccal epithelioma. The manner of growth of the pharyngeal tumour showed that a gradual centrifugal change of epithelium into cancer cells must have taken place. The case could only be explained on the old conception of inductive growth. It was possible to imagine some process similar to that of the trephones which played a part in the healing of wounds. A fruitful field for investigation would be this influence from cell to cell as displayed in leukoplakic epithelium.

The Filterable Agent in Chicken Tumours.

Dr. J. B. Murphy (New York) said that the real nature of the neoplastic "agent" was at last emerging. *Two striking facts indicated that* we had to deal with endogenous chemical substances rather than with extrinsic living viruses; these were the high degree of selectivity and the specificity of the types produced. The chicken-tumour agent was remarkably resistant to ultra-violet light and gave evidence of forming a chemical union with tissues of susceptible animals. Dr. Murphy described experiments to determine the nature of the tumour-inducing agents. The major portion of the resulting purified fraction seemed to consist of a nucleo-protein; it gave a uniform Feulgen reaction of the thymonucleic acid group and produced tumours in fowls with great regularity. It was impossible to believe that this fraction could carry through all its precipitations any living organism or virus, and its enzyme-nature seemed to be established. By similar technique a similar agent producing the typical tumour, transplantable in 90 per cent. of fowls, had been isolated from such tissues as the healthy testicles of normal fowls.

Metabolism and Cancer.

Dr. J. Maisin (Louvain) described experiments on the relation of metabolic disturbances and the appearance of experimental cancers. It had been found that copper and magnesium in suitable doses might delay the progress of cancer and diminish the percentage of metastases; and that nitrate of ionium, injected in large doses before tar-applications, reduced the time before the appearance of cancer and markedly increased the percentage of metastases. This salt also prevented the regression of tar cancers and transformed fowl embryomata into huge polymorphic-celled sarcomata. An albuminous extract of chick embryo accelerated cancer formation, while lecithins and nucleins from blood or chick embryo retarded it. The liver diet of Whipple and Minot and Murphy definitely accelerated the production of tar cancer. Ionium seemed to be capable of destroying vitamin A and modifying cholesterinæmia and glycæmia in rabbits.

Prof. Rhoda Erdmann (Berlin) described experiments showing tumour development in rats taking a diet over-rich in vitamins B and D. The process was one of constant change of the respiratory quotients of the body fluids. First of all only cells which grew with a low quotient multiplied, and formed endothelial and reticular irregularities; then, by a rise of quotient, the cells isolated by these irregularities had a chance to multiply. and so malignant growth might appear. Heart muscle cultivated (*a*) in the plasma of cancerous rats, and (*b*) in the plasma of rats fed on B- and D- deficient diets showed "excess fermentation" in both cases.

Prof. J. McIntosh (London) argued for the virus theory of cancer, and described work on the Rous tumour. He was convinced that the filtrates used were cell free and behaved in exactly the same way as filterable viruses.

Prof. Teutschlaender (Heidelberg) said that three equally important factors coöperated proportionately in the ætiology of cancer: the exogenous agent, the local and general disposition, and the exposition. If disposition preponderated, any stimulus might produce cancer; exogenous noxious agents only produced cancer in a healthy organism through pre-cancer stages, which were the expression of grades of disposition gradually created by the quasi-specific agents. Quasi-specific carcinogenic stimuli not only elicited cancer in a suitably disposed organism, but also created the necessary disposition in a healthy organism. Endogenous substances might have a similar action to that of the exogenous, the diversity and variability of which, and their varied results, proved that they were not the immediate causes. There must be some specific factor, which was undoubtedly endogenous and probably of ferment nature. The macrophage doctrine of this factor was not, however, satisfactory for carcinoma. The factor had been shown to be formed by chemical irritation in embryonal or embryonalised cells which were specially sensitive or sensitised to growth stimuli. The moment of origin of this factor was the critical moment; up till then the "pre-cancerous" state would last. Its formation was preceded by an increase in the permeability of the cell membrane, with consequent alteration in the ionic equilibrium and calcium-potassium coefficients. The problem was a problem of metabolism. "*Factors of exposition*" were all agents that afforded an opportunity for the action of exogenous stimuli, and might be governed by mode of life, occupation, or condition. From the point of view of practical prophylaxis the exposition was the most important factor and should be more carefully studied.

Prof. R. Bierich (Hamburg) described the influence of lactic acid, which was produced in greater quantities in tumour tissues than in normal, and was not immediately removed. Hence it suffocated cells with normal respiratory processes, and only those independent of oxygen could grow. It achieved such a concentration that it dissolved neighbouring cells and so caused malignant invasion.

Prof. Proust (Paris) said that the best hypothesis to explain the phenomena was that of a cell alteration which allowed penetration by cytotropic viruses. Normally these viruses circulated in the blood in a state of adsorption or attached to corpuscles.

THE RELATIVE VALUES OF SURGERY AND RADIATION IN TREATMENT.

Prof. C. Regaud (Paris) opened this discussion. He said that improved therapeutic results were due to advances in technique and knowledge of the use of short wave-lengths. Tumours varied considerably in their sensitivity to irradiation. "Epidermoid epitheliomata" were very sensitive, and could be cured selectively by doses which did not produce extensive radio-necrosis and which left the general tissues almost unaffected. They were the only epithelial cancers cured by radiation almost as a routine. Primary breast cancer was sufficiently sensitive to be cured, but the wide extent and the involvement of the blood-vessels, beside other reasons, made the treatment of election extensive amputation with axillary clearance. Rectal cancers were very radio-resistant; the rectal mucosa was almost as vulnerable as the neoplasm, and the anus gave a poor access. External radiation was useless and internal radiation uncertain. Extirpation was best, or failing that, colostomy, to rest the intestine and check infection of the cancer. Preliminary radiation probably did not affect the result, but rays gave a passing relief in the painful stage. Adenocarcinomata of the uterus, like other glandular cancers, were habitually incurable by selective short-wave radiation. The reasons for these differences in sensitivity were histophysiological; they depended upon the activity and rhythm of the divisions and on the secretory function. The healthy cervico-vaginal epidermis was very sensitive, but its destruction was soon repaired. The mucosa of the mouth, however, being constantly in use, was liable to become infected through denudation.

Cancer of the Cervix Uteri.

Dr. **Malcolm Donaldson** said that the difficulty of estimating the relative values of the two measures lay largely in the absence of reliable figures. Most surgeons were not interested in averages, but in individual patients, and the number of hospitals with follow-up departments was lamentably small. A further difficulty was that of comparison, of knowing which cases were "operable." Standards of cure varied; the five-year rate was not universal, and operability percentages were often calculated on the flimsiest evidence. Certain authorities had, however, obtained valuable results from onerous sifting of the evidence—e.g., Dr. Janet Lane-Claypon in this country, and Heyman, of Stockholm,[1] who gave the five-year survival rate of 3659 hysterectomies as 35·6 per cent., and of 145 cases treated by radiation at the Radiumhemmet as 46·2 per cent. The two treatments were probably equally efficacious in operable cases. Nevertheless the initial mortality from the surgical method was at least 10 per cent., but that from radiation was nil. The operation laid a patient up for two months; the irradiation kept them from work for a fortnight only, and was practically painless, so that patients were not nearly so afraid of it, and sought advice earlier. As a palliative measure in advanced cases it surpassed everything else, and it was bound ultimately to replace excision.

Dr. A. **Lacassagne** (Paris) said that the four factors governing the results of radiation in uterine cancer were the extent of the disease, the quality of the treatment, the histology of the tumour, and the associated infection. They were extremely variable, and the essential condition of success was correct technique. When this was satisfied, the chances of cure of an epitheloma were practically the same whatever the local extent of the disease or its histological variety. This did not, of course, apply to adenocarcinomata. The frequency of associated infections necessitating suspension of the treatment, and of local anatomical changes interfering with it, increased with the extent of the growth.

Dr. W. P. **Healy** (New York) analysed a series of 224 cases, and showed slides demonstrating his classification of epidermoid carcinoma of the cervix into three groups according to their degree of anaplasia, which corresponded closely to their malignancy and radiosensitivity. The success of radiation depended on the promptness of the treatment and the sensitivity of the tumour; surgical success depended on early diagnosis and a low degree of malignancy. Radiation gave better results than surgery in carcinoma of the cervix, without the operative mortality.

Dr. **Max Cheval** (Brussels) described his method of irradiating deep-seated tumours by means of a projection apparatus containing four grammes of radium element. This was applied over large fields in preference to the multifocus method. The very penetrating γ rays caused no disturbance of the general health nor anæmia, wherever they were applied. Thirty-five patients with tumours of the larynx and base of the tongue had been successfully treated, and no necrosis was observed. Large fields would supersede other methods as extended operation had superseded parsimonious excisions. Good results had also been obtained on tumours in other parts of the body, but unfortunately no statistics were yet available.

Dr. E. H. **Zweifel** (Munich) showed tables of collected statistics of the results of X ray and radium treatment of cancer of the uterus. The percentage of cures (five years or more) in a series of 3770 was 16·8, which corresponded roughly with the surgical results. In 1629 inoperable cases, however, the percentage of cures was 11·3. Combined operation and radiation should be practised more often; radiation was valuable both before and after excision.

Dr. J. **Muir** (New York) gave an account of the evolution of the platinum radon seed, which was especially useful for inaccessible lesions.

Mr. **Comyns Berkeley** summarised the results of 616 cases operated upon by himself and Mr. Victor Bonney. The combined immediate mortality was 17 per cent. A surgeon's operability-rate must in fairness be calculated on all the patients he ever saw, in private practice as well as in hospital, and in wards other than his own. The rush of patients to the Middlesex Hospital had made an accurate calculation impossible, but his approximate rate now was only a little lower than the 63·5 per cent. of the early years during which he had used the radical operation. The mortality-rate was a matter of luck; he had had 60 cases without a death and then 9 deaths out of 18; 52 per cent. of his cases had been in Group III., the "query operable" group of continental surgeons.

Of his 616 cases, 276 had had carcinomatous and 340 non-carcinomatous glands. The immediate mortality in the former group was 20·6 per cent., as against 12 per cent. in the latter. Of 517 patients 240, or 46·4 per cent., survived after three years; of these 36 per cent. had had carcinomatous glands removed. At the end of five years 36·8 per cent. survived, of whom 37·8 per cent. had had carcinomatous glands. Whatever the effect of radium would have been on those without glands, it was a matter for speculation whether the 37·8 per cent. with gland involvement would have been alive to-day.

Mr. **Victor Bonney** condemned current methods of classification, and pleaded for the simple statement by radiologists of the number of cases treated and the number surviving after five years, to allow comparison between radium and surgery. It might be useful to see if certain classes were benefited by one treatment rather than another. Five years was not long enough, and the minimum period should be ten. His own figures, up to the end of 1926, were 332 cases with an operative mortality of 16 per cent.; 137 had died from recurrence. Of the 100 patients surviving with whom he was in touch, 64 had completed five years. Including six who had died and 17 who had been lost sight of (all after the five years), the total of survivors after that period was 87, and 51 were alive and well after ten years or more.

Cancer of the Rectum.

Sir **Charles Gordon-Watson** described the method of applying radium from behind by the open perineal route, after removal of the coccyx and division of the junction line of the levatores ani. The vagina was an important auxiliary avenue of approach. An important feature of this method was its attack on the lines of lymphatic spread. For growths extending above the peritoneal reflection the intraperitoneal route was used. Distant radium therapy, from a wax shield moulded to the perineum, would, he thought, prove especially valuable for squamous-celled carcinoma involving the anus. Radiation would probably be found a useful preliminary to excision, and should be used as an accessory to excision to attack glandular enlargement in the lower pelvic meso-colon. Deep X ray therapy on 17 cases of advanced imoperable disease had proved disappointing. Out of Sir Charles's first 15 cases, two were well to-day and one had been cured but had died of intra-peritoneal hæmorrhage on closing the colostomy. Of recent cases several gave promise of cure: time was too short to speak definitely. The radical operation would cure cancer of the rectum in all but the very young, if the patient would consent to colostomy. Until the use of radium became more certain, it was the duty of the profession to advise radical surgery whenever possible, but radium would cure and alleviate more inoperable cases every year.

Mr. W. E. **Miles** pointed out that direct spread of rectal cancer was comparatively slow; venous spread was so rare as to be negligible, but dissemination through the lymphatic system was all-important. Dissemination by the extra-mural system was much more widespread and serious than by the intramural, and the upper zone of spread was more important than the middle and lower. Cancer spread from the rectum chiefly through the ischiorectal fat, the levator ani muscles, the pelvic peritoneum, and the pelvic mesocolon. He had abandoned the perineal operation in 1906, because it had failed to include this upward zone, and had substituted the abdomino-perineal method, from which the recurrence mortality had been 30 per cent. only, in over 300 cases. The operation mortality had steadily decreased.

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[1] Acta Radiol., 1927, viii., 363.

Mr. J. P. LOCKHART-MUMMERY dismissed radium treatment as unsatisfactory. Of 117 private cases treated surgically, the operation mortality had been 3·4 per cent., and in 242 hospital cases it had been 8·6 per cent., although a large number of the patients were over 70. Of 130 operated on over five years ago, 57 had been "cured," 57 had recurred, 8 had died from other causes, and 8 were untraced. Analysis showed that in picked cases the chance of cure was 66·6 per cent., and that even bad cases with intensive involvement were well worth operating upon. Liability to recurrence was extremely variable. Of 50 patients traced beyond the five-years' period, seven had died of recurrence in the sixth year, but none after that.

Dr. DOUGLAS QUICK reported the results of radiation treatment of 710 inoperable and for the most part hopeless cases. Only 150 were living at present; of these 18 were free from disease after 3–8 years, 17 between one and three years, and 10 under a year.

Middlesex Hospital Dinner.

A dinner in honour of the delegates to the Conference was held at the Savoy Hotel on July 17th at the invitation of the Middlesex Hospital and Medical School. Prince Arthur of Connaught presided. After the loyal toasts had been honoured, Mr. E. L. Pearce Gould, the Dean of the Medical School, proposed "Cancer Research." He commemorated the far-sighted generosity of Samuel Whitbread, whose portrait appeared on the menu card and who 136 years ago had given to the Middlesex Hospital its first ward set aside for incurable cases of malignant disease. The success of the Middlesex was due to the uniting under one management of the general hospital, the medical school, and the research laboratory, thus coördinating the whole of cancer research—pathological, biological, radiological, and statistical. The growing sense in the public mind of the seriousness of the problem, the quicker diffusion of knowledge and the higher standard of medical and scientific training, made it possible to prosecute research with good hope of success. Progress might be slow, but those who believed did not make haste. Prof. H. T. Deelman, of Groningen University, replying, described the account he had recently read of a fatal case of malignant disease recorded by a clever physician 300 years ago. Three hundred years hence men would either look on cancer as an historical curiosity or pity us for our ineffectual ways of dealing with it, but they would reap the benefits of our present labours. He paid tribute to English initiative and energy in research. Prof. Raffaele Bastianelli, of the University of Rome, praised the impulse that the Middlesex Hospital had given towards the attack on the cancer problem, and prophesied for it a great future. The health of the Guests was proposed by Mr. W. Sampson Handley and responded to by Prof. C. Regaud, Director of the Institut du Radium in Paris, and Prof. James Ewing, of Cornell University. Sir John Bland-Sutton proposed the health of the Chairman. The party consisted of some 180 hosts and guests and formed a happy occasion for the reunion of workers in many different lands.

SURREY COUNTY HOSPITAL.—This institution, at Guildford, is to be enlarged by the addition of 52 beds. The extension has become necessary largely by reason of the number of motoring accidents.

SHEFFIELD SCHOOL OF MEDICINE.

CENTENARY CELEBRATIONS.

LONG before the University of Sheffield was constituted in 1905 its medical faculty was in existence as the Sheffield School of Medicine, whose history was briefly told in our issue of July 7th (p. 26). The celebrations on July 11th marked the centenary of this school's foundation and testified to its importance in the progress of medical education among the provincial centres of this country.

The proceedings opened in the Firth Hall of the University with an address by the Chancellor, the Marquess of Crewe. In welcoming the delegates from other universities, faculties, and schools of medicine, Lord Crewe mentioned an address delivered 20 years ago by the late Sir Clifford Allbutt, and quoted a phrase which he considered one of the clearest he had ever heard on the function of a university: "the great value of a university education lies in the fact that the students come into contact with and see real research work actually being carried on." This, and the free exchange of ideas which could only occur in an atmosphere of "live work," were, he thought, the most valuable parts of a university education.

Sir Farquhar Buzzard, Regius Professor of Medicine in the University of Oxford, in his reply to the Chancellor, spoke of the fraternal feeling between the old and the new universities, and said that it seemed strange to find a parental university which had only just attained years of discretion watching a member of its school-room celebrate its hundredth birthday. He briefly sketched the early life-struggles of the school.

Sir Humphry Rolleston, Regius Professor of Physic in the University of Cambridge, also referred to the early years of the school. The birth of an institution, like that of an individual, was, he said, by no means painless, but in spite of the difficulties attending its birth, the Sheffield School of Medicine had grown into a very vigorous and flourishing offspring of which the University was justly proud. His own University, he said, owed a great deal to Sheffield, which had sent them that great classic Henry Jackson, and those of his colleagues who knew Henry Jackson wished him to express this feeling and to congratulate the staff of the Sheffield Medical School, whose first whole-time professorship of anatomy was founded by the widow of Arthur Jackson, Henry's brother, to perpetuate the memory of her husband. No history of the Medical School of Sheffield could be written, went on Sir Humphry, without an account of the invaluable services rendered to it by the present professor of medicine, Dr. Arthur J. Hall, who by his unselfish devotion and inspiring influence, poured out for 40 years, had undoubtedly done more for the school than any other single individual. During these 40 years Prof. Hall had held and resigned two previous professorships, those of physiology and pathology, and the invaluable Pathological Museum of the University was almost entirely due to his personal efforts.

Prof. J. Sholto Douglas, Dean of the Faculty of Medicine, then presented to the Chancellor the various delegates, several of whom had been personally connected with the University in its earlier days, notably Sir John Robertson, who was professor of bacteriology, in 1898, and medical officer of health for Sheffield, and Prof. J. S. Macdonald, who was the second whole-time professor of physiology, being appointed in 1902 and holding the chair till 1914, when he returned to Liverpool to succeed Prof. Sherrington. The following delegates were received:—

University of Birmingham, Sir John Robertson; University of Bristol, Prof. Edward Fawcett, F.R.S.; University of Cambridge, Sir Humphry Rolleston; University of Dublin, Prof. Joseph W. Bigger; University of Durham, Sir Thomas Oliver; University of Edinburgh, Prof. G. M. Robertson; University of Glasgow, Prof. John Glaister; National University of Ireland, Patrick Bennett; University of Leeds, Prof. J. Kay Jamieson; University of Liverpool, Prof. J. S. Macdonald, F.R.S.; University of London, Sir Holburt Waring; University of Manchester, Prof. H. S. Raper; University of Oxford, Prof. Sir Farquhar Buzzard; University of Wales, Prof. A. W. Sheen.

Prof. J. B. Black, the Public Orator, then presented Dr. H. H. Dale, F.R.S., Prof. A. J. Hall, Sir Frederick Gowland Hopkins, F.R.S., and Sir Thomas Lewis, F.R.S., for the honorary degree of Doctor of Science. Having conferred these degrees the Chancellor declared the Congregation closed, and Sir F. Gowland Hopkins offered the thanks of the new graduates for the honour paid to them.

The Faculty's Luncheon.

After the Congregation a luncheon was held at the Royal Victoria Hotel, attended by a large gathering of old Sheffield students. Besides the honorary graduates and delegates, the Lord Mayor and Master Cutler were the guests of the Faculty of Medicine, whose chairman, Prof. A. J. Hall, presided over the gathering.

After the loyal toasts had been honoured the Chancellor of the University rose to propose "the Faculty of Medicine." He referred to the close association between the civic authorities of the city and the University, particularly the Faculty of Medicine, whose members did so much to assist in maintaining the efficiency of the health department of the city both directly and indirectly. He did not agree with those pessimists who said that because the young student of to-day appeared to be frivolous the life of the university was doomed, and he quoted in support of this the following statement, made 60 years ago by Acland with reference to Oxford University: "the Government, trade, laws, are not only being criticised and changed, but the conditions of modern society stimulate nervous excitement, and the late hours and feverish life are undermining our very existence." He was reminded by this of the famous saying about another institution that the more it changed the more it remained the same.

On rising to reply Prof. Hall was greeted with prolonged applause. He spoke of the dinner held a hundred years before at the Tontine Hotel, the only record of which was that Dr. Knight was in the chair and that after dinner "several appropriate speeches were made and the convivialities were kept up till a late hour." To-day, said Dr. Hall, they were met to celebrate not a single stone, but a completed building, not at a small inn where post-horses might be changed, but at a large railway terminus hotel; but in spite of these changes there were the same guests at the two functions, including the Master Cutler, town collector, and the chairman of the infirmary. Prof. Hall was glad to say that one of the earlier teachers of the school, Dr. F. Woolhouse, was still alive, though living in retirement in Sheffield, whilst a student of the first 50 years, Dr. A. Payne, still practised in the city, and had been at the Congregation that morning. The school had been saved in its youth, he thought, by two things, a man and an event, the man being Arthur Jackson and the event the founding of Firth College, to which it subsequently became affiliated. Prof. Hall went on to speak of some of the work done by those who had been teachers there, notably Dr. Christopher Addison, Prof. Arthur Jackson, and Sir John Robertson, who, whilst working in inadequate temporary premises as a pathological laboratory, persuaded the Government to institute the compulsory notification of pulmonary tuberculosis. Finally he referred to a generous gift by Dr. Walter Smith Kay, who has presented a sum of money to the Faculty to provide a yearly gold medal to be given to that student who shall have shown most efficiency in the study of mental diseases, a gift which was very happy, because that Sheffield has just instituted a scheme of out-patient mental clinics at the two large voluntary hospitals in association with the South Yorkshire Mental Hospital.—There were a number of other toasts and replies before the luncheon ended.

Reception at the University.

In the evening a reception and conversazione was held at the University, at which the various faculties had arranged a series of demonstrations and exhibitions. The guests were received in the Firth Hall by Colonel and Mrs. H. K. Stephenson and Sir Henry Hadow, after which they were invited to view the various experiments being conducted in all the University departments. In the Firth Hall itself were exhibited a large number of engravings and paintings of famous medical men of the last 100 years, together with old medical text-books and diplomas. The librarian had also displayed in the Edgar Allen Library the valuable collection of ancient books and manuscripts.

That the whole of the centenary celebrations were a success was due in no small measure to the work of the committees and members of faculties who helped to organise it, as well as to the proverbial fine weather which attends anything of importance to the City of Sheffield.

THE OSLER CLUB.

THE Osler Club was founded recently in Sir William Osler's memory by a group of medical students, as an overt acknowledgment of the inspiration of his writings. The general object of the club is for the study of the history of medicine, and it is intended that a general meeting shall always be held on Osler's birthday. Accordingly, on the evening of July 12th, the club met and entertained a number of guests at a meeting held at Wimpole-street, at the house of Mr. Philip Franklin, whose son, Mr. A. Franklin, is the honorary Secretary of the Club.

Sir Wilmot Herringham addressed the meeting in informal speech, the description of which as an Oslerian Oration he deprecated. He spoke of Osler's love of rare cases, not because they represented extremes of normal physiology, but because their rarity appealed to him as an artist. He told how the young Osler, inspired by the German educational "system," and by what he had seen of practical training in Great Britain, completely altered the outlook of medical teaching in America, and how later he was the prominent advocate for the establishment of clinical units in this country. Dwelling happily on Osler's personal charm and affectionate nature, Sir Wilmot closed a speech of genuine feeling.

Dr. E. O. Meynen, representing the German Ambassador, proposed a vote of thanks to the Orator, and wished particular success to the club as an agency for the promotion of international goodwill, under a patron saint whose name was held in reverent esteem in Germany.

Sir Humphry Rolleston then spoke of "Osler as a Human Being," showing that it was the combination of so many different personalities in one body that made Osler the beloved man that he was. Others present who joined in an Osler symposium were Prof. D. Fraser-Harris, who spoke of him as a physiologist; Dr. H. H. Scott, who dwelt on his merits as a naturalist and comparative pathologist; Dr. Andrew Balfour, who testified to his deep interest in tropical medicine; Sir Squire Sprigge, who regarded him as a great man of letters, Sir Walter Fletcher, Dr. Franklin Martin (President-Elect of the American College of Surgeons), Dr. J. D. Rolleston, and Dr. Ernest Jones.

Among other guests of the club were Sir Thomas Lewis, Dr. Burton Haseltine (Chicago), Mr. Geoffrey Keynes, Mr. S. Damian, Dr. Henry Viets (Boston), and Mr. Philip Franklin, and an opportunity was given to see an exhibition of a selection of Osler's writings, literary and scientific, of biographical appreciations and of books inspired by him, bearing witness to the many-sided nature of his interests and enthusiasms.

A reproduction of the Sargent crayon sketch of Sir William Osler, lent by the Royal Society of Medicine, occupied the place of honour, and through the kindness of several London librarians, pictures of the Triumvirate of British Medicine—Linacre, Harvey, and Sydenham—were displayed, together with some of Osler's favourite books—Religio Medici. The Anatomy of Melancholy, Lettres de Gui Patin.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Congress of the Royal Institute of Public Health.

THE plans for the Congress of the Royal Institute of Public Health, which is to be held in Dublin from August 15th to 20th, are approaching completion. The honorary President of the Congress is Mr. James McNeill, Governor-General of the Irish Free State, and the President is Mr. Richard Mulcahy, Minister for Local Government and Public Health. The work of the Congress will be carried out in four sections: Section I., State Medicine; Section II., Bacteriology, Pathology, and Biochemistry; Section III., Maternity and Child Welfare, School Medical Inspection; Section IV., Production and Control of Milk and Food. Several interesting discussions have been arranged, and a pleasant programme is also prepared for the entertainment of members of the Congress. It is an additional attraction that the National Athletic Festival of Ireland, the Failteann Games, is to be held in Dublin at the same time.

The Dentists Bill.

The Bill for the registration of dentists in the Irish Free State has at length passed the Senate. There was no difference of opinion on the general principles of the Bill, which follows closely the British Act of 1921, but a great deal of time was spent in consideration of the position of unqualified dentists who had failed to register under the Act of 1921. Many senators appeared, indeed, to be more interested in the protection of unqualified dentists than in the protection of the public. Finally, the Minister in charge of the Bill accepted an amendment, by virtue of which unqualified dentists who have been practising dentistry as their principal means of livelihood since 1921, and were then 21 years of age, will be permitted to register as dentists if they succeed in passing an examination conducted by the Minister or by the Dental Board. It is somewhat of an anomaly that the Dental Board is mentioned, since all other matters concerning the education of dentists are put under the supervision of the Medical Registration Council, and not of the Dental Board.

The Local Authorities Bill.

Mr. De Valera's Bill to amend the Local Authorities Act of 1926 was defeated last week in the Dail on the motion for its second reading. The Government is to be congratulated on its determined opposition to the Bill, which would have gone far to nullify the good effects of the principal Act. It is doubtful, indeed, whether Mr. De Valera's party was very anxious that the Bill should pass, and the genesis of the Bill probably lay in the desire to court popularity with the members of the local authorities who have been "disquieted" by their loss of power and patronage. In the lengthy debates of the past few weeks no single case was quoted in which the present method of making local appointments could fairly be said to be at fault. In regard to medical appointments there cannot be any doubt that the electors have under the present system a much wider range of choice than electors had formerly. Before the Act of 1926 only a few candidates, possessed of local influence, presented themselves as candidates for an appointment. Now that appointments are made on their merits by an independent body the choice lies not among three or four candidates, but among three or four score.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 7TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 182 (last week 219); scarlet fever, 1715; diphtheria, 912; enteric fever, 52; pneumonia, 716; puerperal fever, 45; puerperal pyrexia, 85; cerebro-spinal fever, 14; acute poliomyelitis, 13; acute polioencephalitis, 2; encephalitis lethargica, 31; continued fever, 1; dysentery, 13; ophthalmia neonatorum, 106. No case of cholera, plague, or typhus fever was notified during the week.

The number of patients in the Infectious Hospitals of the Metropolitan Asylums Board on July 10th–11th was as follows:—Small-pox, 41 under treatment; scarlet fever, 1757; diphtheria, 1889; enteric fever, 16; measles, 448; whooping-cough, 176; puerperal fever, 31 (plus 6 babies); encephalitis lethargica, 66; poliomyelitis, 1; "other diseases," 30. At St. Margaret's Hospital there were 21 babies (plus 16 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox or enteric fever, 33 (7) from measles, 4 (0) from scarlet fever, 21 (4) from whooping-cough, 22 (5) from diphtheria, 51 (7) from diarrhœa and enteritis under two years, and 24 (3) from influenza. The figures in parentheses are those for London itself.

Of the 26 fatal cases of measles outside London 8 were reported from Liverpool and 4 from Newcastle-on-Tyne. Of the 17 cases of whooping-cough outside London 4 were reported from Birmingham. During the same week Glasgow reported 7 deaths from whooping-cough. Liverpool and Salford each reported 3 deaths from diarrhœa.

The number of stillbirths registered during the week was 308 in the great towns (corresponding to a rate of 41 per 1000 births), including 54 in London.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

The following appointments are notified:—Surg.-Capt.: C. T. Baxter to *Vivid* for R.N. Barracks, Devonport. Surg.-Comdrs.: T. J. O'Riordan, lent to N.Z. Division; L. Warren to *Queen Elizabeth*; A. Craig to *Pembroke*, for R.N. Barracks, Chatham, and to *Emerald* (on recommg.); J. D. Keir to *Pembroke*, for R.N. Barracks, Chatham; and A. G. Taylor, to *Cairo* (undated). Surg. Lieut.-Comdrs: J. W. Tighe to *Pembroke*, for Sheerness Dockyard; H. L. Douglas to *Cairo*; and J. E. Clark to *Tamar*. Surg. Lieut.: E. J. Weeks to *Fisgard*. Surg. Lieut. (D.): G. Baker to *Victory*, for R.M. Infirmary, Portsmouth, and to *Victory* for R.N. Barracks.

ROYAL ARMY MEDICAL CORPS.

Maj. W. J. Dunn retires on retd. pay and is granted the rank of Lt.-Col.

The undermentioned Capts. to be Majs.: J. Cullenan, C. O. J. Young (Prov.), and R. N. Phease.

Temp. Lt. P. Weiner relinquishes his commn.

TERRITORIAL ARMY.

J. H. Dunn (late Surg. Sub-Lt. R.N.V.R.), H. Broadbent, F. H. Hollingshead, Lt. R. I. Poston, 2nd Lt. S. G. M. Lynch, and F. Lawrence to be Lts.

ROYAL AIR FORCE.

Flying Officer F. A. O'Connor resigns his short service commission.

INDIAN MEDICAL SERVICE.

Lt.-Col. G. O. F. Sealy retires.

S. Hartley to be Capt. (on prob.).

Bijeta Chaudhuri, Shankar Sahai Bhatnagar, C. F. J. Cropper, K. H. A. Gross, E. V. Claydon, V. H. Sarland, J. Acheson, E. A. O'Connor, J. P. J. Little, P. L. O'Neill, and V. T. J. Lynch to be Lts. (on prob.).

THE NEW BETHLEM HOSPITAL.—Last week Prince Arthur of Connaught, in place of the Duke of Connaught, his father, who has been indisposed, laid the foundation-stone of the new Bethlem Hospital at Monk's Orchard, Shirley, near Croydon. The Lord Mayor of London recently presided at a dinner at the Mansion House in aid of the building fund. The cost of the new buildings will be £450,000, of which £330,000 was available. Towards the balance of £120,000 £42,000 has already been raised; of this sum Sir Charles Wakefield, President of the Royal Hospitals of Bridewell and Bethlem, has given £25,000.

Obituary.

WILLIAM DYSON, M.D. LOND., J.P.

THE death, at Sheffield, on July 9th of Dr. William Dyson in his seventy-ninth year will recall to many members of the medical profession in the Northern Midlands a name which was familiar to them in the later decades of last century and the first half of this.

Born in 1849 at Thurgoland, near Penistone, of an old Wesleyan stock, and educated at the then Wesley College, Sheffield, Dyson's medical studies were carried out at University College Medical School, London, where he was a fellow student with, and a close friend of, Sir Thomas Barlow. At his final M.B. Lond. in 1873, he took honours in medicine and midwifery, afterwards holding resident appointments at University College Hospital. He then returned to practice in Sheffield, being appointed physician to the Sheffield Public Hospital (now the Royal Hospital) in 1876, and resigning this post in 1885 on being elected physician to the General (now Royal) Infirmary, with which institution he remained in active connexion for 27 years. On his retirement in 1912 he was made a consulting physician. During this time his success as a consultant was very great. It began early, continued long, and extended over a wide area. He came to Sheffield just when medical knowledge was undergoing great developments, and as a representative of the new school he soon displaced such few older competitors as there were. For the next 25 years he had the field of medical consulting work almost entirely to himself. It was, writes one of his colleagues, his gentleness and sympathy in dealing with all with whom he came in contact, coupled with an exceptionally thorough knowledge of his professional work, which no doubt gave the key to his wide popularity as a consultant and to his very successful practice.

Dyson took an active interest in the school of medicine, of which he was a member of the teaching staff for many years. When the University College was founded in 1897 he became the first professor of medicine, and on retiring from that post in 1901 was appointed emeritus. On the death of William Favell in 1897 Dyson was appointed a Vice-President of the College in his place, and became the recognised leader of the profession. In the same year he was elected to a vacancy on the Town Trust, of which he remained an honoured member until his death. He was also, as his father before him, on the Commission of the Peace for the West Riding. He took an active interest in the Sheffield Medico-Chirurgical Society the Yorkshire branch of the British Medical Association, and the West Riding Medical Charitable Society, holding office in each. When the British Medical Association proposed to hold its annual meeting in Sheffield in 1908, Dyson was invited unanimously by his colleagues to be nominated as its President. This, however, he was obliged to decline on the grounds of health.

Of a modest and retiring disposition, Dyson was seen at his best in the medical wards which he loved. Successive generations of practitioners and students all testify to his unusual abilities as a clinician and as a teacher. Public work and ceremonial occasions were distasteful to him, and he found the effort of them very great. Always somewhat delicate, writes the same colleague, the strain of his large practice told heavily upon him. Nor is this a matter for surprise. The motor-car had not then come into use. All country work had to be done by train or by carriage, so that a large consulting practice in those days involved very long hours indeed, and much weary time spent in travelling. To those outside the area in which his practice lay, Dyson's name was less well known than his clinical knowledge and skill deserved. The constant calls of practice allowed him little time for writing after a few early contributions to medical literature on cases of special interest. By colleagues and students he was beloved as an intimate friend.

Dr. Dyson retired from practice some years ago. In 1916 the loss of his younger son, William Hubert, an officer in the Queen's Westminster Rifles, who died of wounds in the German lines after leading a raid into the enemy trench, was a blow from which he never recovered. His death occurred only a few days before the centenary of the Medical School, and a fitting tribute to his great services was paid by the Chancellor before the opening of the Degree Congregation at Sheffield University in connexion with its celebration. His widow, a son—Dr. Ernest Andrews Dyson, of Guildford—and a daughter survive him.

Correspondence.

"Audi alteram partem."

INTENSIVE SERUM TREATMENT OF SEVERE DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—We should like to add our testimony to that of Dr. H. S. Banks and Dr. G. McCracken as to the value of *very* large doses of antitoxin in the treatment of the severe toxic case of diphtheria. In this hospital we have been accustomed, for several years past, to employ doses of "concentrated" antitoxin comparable in unitage with those used by Dr. Banks and his colleague. There has hitherto been one important difference between our procedure and theirs—viz., the route of injection. The subcutaneous route is never employed by us; the vast majority of our cases has received antitoxin intramuscularly. In only a minority of the worst class of case a relatively small intravenous injection has been given in addition. Until we were made aware, some few weeks ago, of Dr. Banks's work we had been fairly satisfied with our recovery-rate; but the record of his results has led us to analyse in detail the cases admitted to Little Bromwich Hospital with a diagnosis of diphtheria during the 12 months of 1927, with a view to finding out whether our recovery-rate might be still further improved.

As regards case mortality over the whole series, consideration of the figures which we submit below will, we think, show that there is little to choose between Banks's and McCracken's percentage and ours. But detailed consideration of the case mortality and complication-rate in the different classes of case shows that the employment of large doses of antitoxin by the intravenous route produces results far superior to those obtained, in comparable cases with comparable unitage, when the intramuscular route is employed. During the 12 months ended Dec. 31st, 1927, a gross total of 1842 cases was admitted to this hospital with a diagnosis of diphtheria. From this total has to be subtracted no less than 542 cases which were examples either of so-called "bacteriological diphtheria" or conditions other than diphtheria. This leaves a net total of 1302 cases of indubitable clinical diphtheria. These 1302 cases are analysed in the table.

Comparing Dr. Banks's Classes A and B which received, almost exclusively, large doses of antitoxin intravenously, with our similar classes, it will be seen that his case mortality is 10 per cent. *less than* ours in Class A and non-existent in Class B (against our 4·6 per cent.); and whereas Dr. Banks dwells upon the rarity of, at any rate, severe pareses, such complications, in our Class A occurred in *more* than a third of the survivors. In the remaining groups our paresis-rate (all types being included) is satisfactorily low. Of the 19 cases in our Class A who received a small dose of antitoxin intravenously in addition to a large dose intramuscularly, 7 were hopelessly toxic and died within a few hours of admission; 2 others died within 15 days of myocardial failure, and 1 in the fifth week of diaphragmatic paralysis. Of the survivors 6 recovered without complications; the remaining 3 had palatal paresis only.

This year we have largely increased our intravenous dosage in the Class A case. We now give 40,000 or more units by that route in addition to a following-dose intramuscularly. The results in a consecutive series of 19 cases are as follows: 1 died within a few hours of admission; 3 died later from myocardial degeneration. Of the remainder 14 have recovered with nothing more serious than slight palatal paresis and one after palatal and pharyngeal paresis of greater severity. Until it comes about that a preventible disease is prevented, it is some satisfaction to know that the large dose of antitoxin given intravenously is capable of obviating at least some of the tragedies which otherwise must occur.

Analysis of 1302 Cases of Indubitable Clinical Diphtheria.

A = Malignant or severely toxic. B = Moderately toxic. Ci = Moderate. Cii = Mild. D = Laryngeal (purely).

	A.	B.	Ci.	Cii.	D.	Total.
Cases	142	87	76	975	22	1302
% cases in each group	10·9	6·6	5·8	74·8	1·6	
Aver. no. of units of antitoxin ..	I.M. 80,000†	I.M. 50,000	I.M. 32,000	I.M. 8,000–24,000	I.M. 8,000–24,000	
Deaths ..	46	4	1	1	4‡	56
Of these died under 48 hrs.	22	2	—	—	—	
Gross case mortality %	32·4	4·6	1·3	0·1	18	4·3
Case mortality minus 48 hr. deaths	17	2·3	1·3	0·1	18	2·46
Recovery *without* pareses* ..	46 (32·4 %)	66 (75·8 %)	71 (93·4 %)	959 (98·3 %)	18 (100 %)	1,160 (89 %)
Recovery following pareses* ..	50 (35·2 %)	17 (19·6 %)	4 (5·3 %)	15 (1·6 %)	—	86 (6·7 %)

* Percentages calculated on survivors. † Plus I.V. 12,000 in 19 cases. ‡ All broncho-pneumonia.

We should like to congratulate Dr. Banks and Dr. McCracken upon their results.

We are, Sir, yours faithfully,
E. H. R. HARRIES.
W. M. MACFARLANE.

City Hospital, Little Bromwich, Birmingham,
July 11th, 1928.

RADIOTHERAPY OF CANCER.

To the Editor of THE LANCET.

SIR,—In your issue of July 7th (p. 34) there is a short description of the findings of the subcommission of experts charged by the Cancer Commission of the League of Nations with the study of radiotherapy of cancer, at its preliminary meetings on June 18th and 19th, under the presidency of Prof. Cl. Regaud. One paragraph reads:—

> "On the broader questions relating to the treatment of uterine cancer by radiology the President submitted a series of considerations which, after a general discussion, were adopted by the subcommission as representing the most important directions to which its future discussions should be directed, and on which definite recommendations should be made in due course to the Health Committee with a view to publication. Among these considerations were: 1. Propaganda among doctors and the general public in order to ensure the early discovery and early and correct treatment of cancer of the uterus. 2. Increase in the number of consultation centres. 3. Organisation of centres for microscopic analysis in order to ensure early diagnoses. 4. Recommendations for the organisation of the correct treatment of the disease. 5. Recommendations for the radio-therapeutical equipment of clinics. 6. Disadvantages of out-patient treatment. 7. Recommendations for the compilation of reliable statistics. 8. Recommendations for special scientific research."

I should like, with your permission, to draw attention to the fact that on May 14th last I sent you a contribution on radium therapy in which almost identical suggestions were embodied. These suggestions of mine were:—

1. Large hospitals with many cases of sufferers from carcinoma or sarcoma should engage in research and treatment by radium and radio-active substances.

2. Owing to scarcity and the danger of supply being at least temporarily exhausted, or the market price altered by increased demand, small hospitals, where the radium would lie idle for periods, should not be encouraged, and suitable cases should be referred to large centres. If needs be, the patients' fares and maintenance might be paid; as in Sweden. A small quantity of expensive radium in any case is useless, and cannot be applied without expert technical guidance.

3. These large radium centres would link up throughout the country and deal with the cancer plague territorially—each to be a centre for treatment, research, and teaching, with post-graduate and student courses—not only in radium therapy, but also as anticancer centres for investigations from every aspect of the whole problem, with sociological, pathological, biological, medical, surgical and radio-therapeutic measures, all being carried on by team methods.

4. Frequent opportunities should be made for free intercourse and discussion on new methods between all anticancer centres, with opportunities to see the best work of other countries, with interchange, as necessary, of working members of the staffs.

5. Statistics of results, with exact technique, to be kept, compared, and published for the benefit of other investigators.

6. No effort should be spared to obtain the attendance of patients when in an early stage. With the fear of operation reduced, this should soon be an easy matter, subject to proper enlightenment and encouragement of the public through the publicity of the Ministry of Health, the public health authorities, and the private practitioner, whose coöperation is most essential to allay the dread of sufferers who shrink from the idea of the operating table, and to hearten them to seek treatment voluntarily at the earliest moment by the newest scientific methods, painlessly applied.

My great interest in this matter has been stimulated from the reason that, although I have been brought up for the greater part of my life in surgical operating theatres, within the last few months I have been so strikingly impressed by recent results of radium treatment that I feel most strongly on the question.

I am, Sir, yours faithfully,
SPENCER MORT.

North Middlesex Hospital, Upper Edmonton,
July 10th, 1928.

MIGRAINE.

To the Editor of THE LANCET.

SIR,—Dr. Purdon Martin, writing in your issue of July 14th (p. 82), is, I think, under a misapprehension as to my point of view. He says that I have regarded migraine as a psychoneurosis. What I have said is that "however skilful the ophthalmic surgeon, and however meticulous the general treatment, although relief from the actual paroxysms may be obtained, *the patient does not become well*, unless the psychological situation is elucidated and adjusted." This statement, empirical though it may be, is, I believe, true; and I do not know many people who will care to contradict it. I do not know if Dr. Purdon Martin was amongst the audience who, last night, listened to an admirable address by Dr. Seif, of Munich, before some of the Adlerian groups in London, but he could hardly have heard a more convincing statement of the reasons for treating, not hypothetical and hypostatised diseases, but *individual patients* whose life and health is disordered. And the fact is that, when the psychological state, as well as the physical errors, of the migrainous is adjusted, the patients get well and keep well. Whether or no this fact implies that "migraine is a psychoneurosis" I do not know, in the absence of a definition of a psychoneurosis. Nor do I know why the suggestion that migraine is a psychoneurosis should seem inadequate to account for such a symptom as ophthalmoplegia. I do not find it more difficult to believe that paroxysmal ophthalmoplegia should disappear when psychical states are adjusted than I do to believe that diarrhœa, involuntary lacrymation, involuntary micturition, impotentia coeundi, angina pectoris, "functional" paralysis, hystero-epilepsy, and a hundred other conditions should occur when psychical states are disturbed and disappear when they are adjusted.

I do know this, that some years ago I had ophthalmoplegic migraine of so persistent a nature that several kind and skilful friends begged to be allowed to do something to one of my tendons! I am grateful to them, but much more grateful, on the one hand, to those who insisted on correction of the "organ inferiority"—irregular astigmatism and muscular defect—by glasses, and on the other, to those who helped me to see the psychological error and difficulty. But my position is diametrically opposed to that of those who, regarding "migraine as a psychoneurosis," let it go at that, and (in another direction) to that of those who, while believing migrainous attacks arise "in some way from a functional disorder of the vegetative nervous system," do not inquire what are the psychological difficulties correlated with this disorder. The proof of the pudding is in the eating. Migrainous people, unless they are old, and their attacks have become organised, and their arteries stiff, and their kidneys inadequate, *do get well;* if, that is, in addition to correction of their organ-inferiorities and adjustment of their physiological divagations, investigation and adjustment of their psychological troubles is carried our. Explanations and theories have a secondary place. The thing *works*.

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ANATOMICAL NOMENCLATURE.

To the Editor of THE LANCET.

SIR,—In your annotation of May 26th under this heading you do me, I believe, an injustice, but that is a detail. The Anatomical Society, at its recent meeting in Manchester, appointed a committee with a view to revision of the Basle Nomenclature (B.N.A.). I beg now through you to offer my services, unofficial, unconditional, whole-hearted, and loyal, in the way of criticism and suggestion *only*, hoping to be able to indicate how, beginning with the B.N.A. and applying the principles advocated by its own authors, we may evolve such a nomenclature as will win favour and survive solely because of its fitness. In the past I have made many mistakes. I take what comfort I can from the thought that he who makes no mistakes may make nothing else.

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Lord Banbury's Amendment.

On the motion for the third reading of the Dogs Act (Amendment) Bill, which has already passed the Commons.

Lord BANBURY moved to leave out Clause 2. He said that under the Act of 1906 Clauses 3 and 4 must be read together. Clause 4 was the clause which under this Bill it was proposed to leave out and substitute for it another clause which he (Lord Banbury) proposed to leave out, thus leaving the law in exactly the same position as it was now. Clause 4 of the Act of 1906 said that:—

> "Any person who takes possession of a stray dog shall forthwith either return the dog to its owner or give notice in writing to the chief officer of police of the district where the dog was found."

Clause 3 which must be read in conjunction with it said:—

> "Where a police officer had reason to believe that any dog found in a highway or place of public resort is a stray dog, he may seize the dog and may detain it until the owner has claimed it and paid all expenses incurred by reason of its detention."

Subsection (5) said:—

> "No dog so seized shall be given or sold for the purposes of vivisection."

That was the law as it stood now. In February of this year a Bill was introduced in the House of Commons, the chief object of which was to make owners of dogs liable for injury to poultry. To that he had no objection. But it then went on to repeal Section 4 of the principal Act which he had just read and to substitute this:—

> "Any person who takes possession of a stray dog shall forthwith either return the dog to its owner or deliver the dog to a

police officer of the police area in which the dog was found and inform that officer where the dog was found."

The clause further said :—

"A dog which has been delivered to a police officer under this section shall be treated as if it had been seized by that officer in pursuance of Section 3 of this Act."

That was to say that if any dog was seized by a police officer it should be treated in pursuance of the Act of 1906, with the result that no stray dog or lost dog which was taken to the police would be used for the purpose of vivisection. That was the Bill as introduced in the House of Commons, as it passed the second reading in the House of Commons, and as it passed the Committee stage in the House of Commons. On the Report stage, however, an amendment was moved to leave out the clause and insert another one which was in the Bill before their lordships. The effect of that clause was that the protection which existed at the present moment against the use for vivisection purposes of a stray or lost dog was done away with. Under the clause which he proposed to leave out there were two alternatives. A person who found a stray dog had to take it to the police station. If the person did not want to keep the dog the police took possession of it, and they could not sell it for the purposes of vivisection. On the other hand, if the person who found the dog was a person whose object it was to look for stray or lost dogs in order to make money out of them by keeping them for a month and then selling them for the purposes of vivisection what was to prevent him? If a person was not very scrupulous and he found a dog with a collar on it he could remove the collar and throw it away before taking the dog to the police station. In that case the identification of the dog was to a certain extent lost and the profit which the man was going to make was pretty sure. Knowing human nature and bearing in mind a case that occurred not very long ago when two dogs were found in a sack, and another case in which a dog had been taken off the doorstep of its owner, and they were all found at an institution where vivisection was carried on, he ventured to say that it was pretty certain that under this alternative of the law there would be people who would take advantage of it for the purposes which he had suggested. He would prefer if their lordships left out Clause 2, that the clause which was originally in the Bill should be reinserted. But he did not wish to insist upon that if their lordships would only leave out Clause 2. He hoped the House would support him because this was an insidious attempt to obtain all stray or lost dogs for the purposes of vivisection.

Lord Dawson on Vivisection.

Lord DAWSON of PENN said that they had to consider two varieties of dogs. One was the owned dog. Was there any Member of that House who would not take any precaution necessary to preserve the owned dog to its owner? Then there was the stray dog, which wandered about eking out such a living as it could, uncared for, a misery to itself and a danger to the community. The extent of that problem was shown by the fact that each year something like 30,000 stray dogs were destroyed in the City of London alone. Was it not obvious, if there was to be the same provision for both varieties of dogs, that the owned dog would suffer? If they put an embargo on the use of the stray dog for experimental purposes, would they not correspondingly endanger the owned dog? The Bill provided extremely well for that contingency. Its provisions would help in the identification of the owned dog and diminish the chances of mishap. Therefore it deserved the support of that House. It was clear that the object of Lord Banbury was not the protection of the owned dog. Underlying all Lord Banbury's remarks was this, that he was making this an opportunity for a flank attack on the use of dogs for experimentation. He (Lord Dawson) would take up his challenge, for it was clear enough that the question of experimentation on animals stood or fell by the use or not of dogs. Whichever way they approached this question of experimentation on dogs, surrounding it by as much misrepresentation of fact as they would—and there was no subject he knew of which was more misrepresented than this—they always arrived at two aspects of the question. The first one was: Do material advantages accrue to mankind from experimentation on dogs and experimentation on animals in general? The second question, a totally different one, was: Whatever those advantages may be, is it ethically justifiable that mankind should take advantage of them?

The first question, whether material advantages accrued to mankind, was surely a question for those people with skilled knowledge. There was no one else who could give the answer "Yes" or "No." Supposing, for example, that they were building a bridge across a river. They might decide the policy as to whether the bridge should be built or not, but whether the bridge should be built of chrome steel or manganese steel, or whatever the distribution of the stresses should be, would be left to the engineers. The problem of the engineer was nothing in comparison with the problems which arose in connexion with the body and mind of man. He would not trouble their lordships with too much on the question whether man did gain advantages from experiment or not, but there was this remarkable fact. We were accustomed to find experts differing materially, but on this question of experimentation on dogs there was such a consensus of opinion among the medical men of the civilised world that it amounted to a practical unanimity. They had recently had a conference representing every aspect of medicine and surgery, and of the sciences on which medicine and surgery rested. A more representative conference there could not be, and that conference said this to the British nation, that without experimentation on animals medicine and surgery could not carry on. He did not mean that they would not carry on; of course they would do their best; but, intellectually, they would come to stagnation. He would put the matter in another way. Supposing he were asked to find a staff for a hospital of, say, 200 beds in London, and had to find surgeons and physicians of sufficient standing on the one hand, and who would embrace the principles that Lord Banbury advocated. He had to tell the House that he could not find such a staff; it did not exist. That would indicate to the House to what extent medical unanimity prevailed.

The Ethical Aspect.

The honest opponents were those who approached the question from the ethical standpoint. He had in mind the man who said: "Whatever the advantages that accrue to mankind, it is ethically unjustifiable that you should make use of them." He respected that man, provided that he did not himself make use of those remedies in his time of trouble. It was a question for the public. They invited the public to answer that question. It was for them to say "Yes" or "No." If they said "Yes," by all means let them have the legislation which would make all these things illegal. That, at any rate, would be an honest and straightforward course. If, on the other hand, the answer was "No; we do not wish to stop these things," then he said: "For Heaven's sake leave us alone to go on with our work and do not harass us day by day and year by year." He had admitted that the question whether it was ethically justifiable to make use of experiments on animals should be decided by the public, and what was true of the dog was true of other animals. The medical profession told the House, with a real sense of responsibility, that they could not do without dogs—that they could not substitute other animals in every case. Their universal rule was that they never used an animal higher in the scale of creation than was absolutely necessary. They used the lowest animal possible, compatible with doing their best and getting successful results. In order that the public might be in a position to answer the question whether it was ethically justifiable, it would be of some profit if he tried to clear away a few misconceptions. He would take the question of pain. Was it likely that those of them whose upbringing had been in associating with pain from their student days were going to do anything which would needlessly increase pain when their whole careers were spent in assuaging it? They were not likely to be less sensitive than Lord Banbury on the question of inflicting pain. On the contrary, they knew more about it and what it meant. Therefore he would not waste time in dwelling upon any question of the indifference of the medical profession to pain. As to the 30,000 animals that were anæsthetised every year, all they asked was that they should be made use of not only for the benefit of mankind, but for themselves. It must be borne in mind that the large majority of experiments on animals were carried out under anæsthetics, and the dogs and other animals were completely ignorant of what was going on. He would go further than that. He would admit that there were a minority of cases where animals were given diseases in order to aid in the diagnosis of disease in man. He admitted, further, that there were, from time to time, what they called survival experiments. He would tell their lordships exactly what survival experiments meant. A greater part of the treatment of gastro-intestinal disease in modern times depended mainly upon experiment on animals. One of the most distinguished men of modern times was Prof. Pavlov, of Russia. As an example, he would take the case of a man who was going to be short-circuited for duodenal ulcer. They might take his pain and distress and divide them into three parts. There was, first, the stage of anticipation. There was that stage when he had to make up his mind to face the risks to himself and his family, and when he said to himself, "Supposing I do not survive. What is going to happen to me in my profession?" All these agonies of mind far exceeded distress of body. Man had to go through all that, not the animals. The animal had none of that, and he had no power of anticipation whatever. The second stage was that of the actual operation of short-pectoris, "functional" paralysis, hystero-epilepsy, and a hundred other conditions should occur when psychical states are disturbed and disappear when they are adjusted.

I do know this, that some years ago I had ophthalmoplegic migraine of so persistent a nature that several kind and skilful friends begged to be allowed to do something to one of my tendons! I am grateful to them, but much more grateful, on the one hand, to those who insisted on correction of the "organ inferiority"—irregular astigmatism and muscular defect—by glasses, and on the other, to those who helped me to see the psychological error and difficulty. But my position is diametrically opposed to that of those who, regarding "migraine as a psychoneurosis," let it go at that, and (in another direction) to that of those who, while believing migrainous attacks arise "in some way from a functional disorder of the vegetative nervous system," do not inquire what are the psychological difficulties correlated with this disorder. The proof of the pudding is in the eating. Migrainous people, unless they are old, and their attacks have become organised, and their arteries stiff, and their kidneys inadequate, *do get well;* if, that is, in addition to correction of their organ-inferiorities and adjustment of their physiological divagations, investigation and adjustment of their psychological troubles is carried our. Explanations and theories have a secondary place. The thing *works.*

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the criminal proceedings
w left it still open for the
st and for the jury, notwith-
agistrates had thrown out the
ty of murder. That was a very
nd for that reason he had brought

Bill was granted without a division.

nosis of Small-pox Cases.

ked the Minister of Health whether, in
that the cases of small-pox occurring in
present time were so mild as to be hardly
from chicken-pox, and also of the fact that
ical men believed they were not small-pox at
strim or a new disease, he would issue fresh
s permitting medical officers of health to leave
their own homes and not put the patients to the
ort and the ratepayers to the expense of having
emoved to the small-pox hospital.—Mr. CHAMBERLAIN
d: I am advised that the small-pox now prevalent in
country should not be confused with chicken-pox or
me new disease, and in view of the risks to the public
alth which would be involved by its further spread, I
m not prepared to countenance the course suggested by the
hon. Member.

THURSDAY, JULY 12TH.

Ex-Service Men and Medical Treatment.

Mr. STEPHEN asked the Minister of Pensions what remedy an ex-Service man had when he was recommended by the Ministry for treatment at home by his panel doctor and the panel doctor certified that treatment by the Ministry was necessary.—Major TRYON replied: Where it had been decided that a case was either not eligible for or did not require such a course of treatment as is provided by the Ministry of Pensions the case would fall to be dealt with under the ordinary arrangements available to insured persons under the National Health Insurance Acts.

Mr. STEPHEN: If the Minister decides that treatment is not possible and the man's panel doctor considers that
atment by the Ministry is necessary what step has the
then to take?

lajor TRYON: It is quite clear that the Ministry cannot
pt the doctrine that a panel doctor can decide for them.
he man has a grievance against the panel doctor the
nal course would be for him to make an application to
insurance committee.

STEPHEN: But supposing the man has no grievance
st his panel doctor; supposing that he considers that
lvice of his panel doctor is right, is there not a medical
e whose opinion the Ministry and the panel doctor
asked to accept? If there is not, will the Minister
such a referee?

r TRYON: No, Sir. The ordinary course must be
l. The case would be considered by the doctors of
istry of Pensions whose opinions must necessarily
e action to be taken by the Ministry.

: Does the Minister say that the doctors of
y must be the final arbiters in spite of the fact that equally eminent or more eminent medical men may say that the man ought to have treatment?

Major TRYON: No, Sir. The point is that the Ministry of Pensions must decide its own policy and not the panel doctor.

Mr. HARRIS: When doctors disagree would it not be
ossible to have an independent opinion from a specialist,
se it is notorious that doctors often differ on medical

answer was given.

fication in a Case of Lead Poisoning.

NCE asked the Secretary of State for the
ment if his attention had been drawn to the
nald Aubrey Wild, who contracted lead poisoning
rking for Messrs. Locke, Lancaster, and W. W.
Johnson and Sons, Limited, of Millwall; whether
s aware that on application to the certifying surgeon
a certificate the same was refused, the certifying surgeon
eing the same doctor that was in the service of the employers; that the medical referee for the district, who formerly was the employer's doctor, had given a decision that the man was suffering from lead poisoning, but that he was not disabled; and whether, seeing that Mr. Wild was an in-patient in the London Hospital, suffering from lead poisoning, from April 20th until May 14th, after receiving a week's notice on April 15th, he would arrange for the man to be examined by a medical referee attached to another district as, until he was certified, no claim could be made for compensation.—Sir WILLIAM JOYNSON-HICKS replied: The decision of the medical referee under the Act is final, and I have no power to intervene in the manner suggested. I am, moreover, satisfied on inquiry that this case has been most carefully and conscientiously dealt with both by the certifying surgeon and by the medical referee, and I strongly deprecate the implication that these gentlemen, both of whom are medical practitioners of high standing, may have been influenced in carrying out their statutory duties by their connexion with these works. The certifying surgeon is responsible in his official capacity for the periodic examination of workers employed in lead processes under the Lead Compounds Regulations; he also, I understand, periodically examines the other workers and examines workmen newly employed, but has no other interest in the firm. The medical referee used to carry out some three years ago the periodic examinations required by the regulations, but he did this under special appointment from the Chief Inspector of Factories. and he was not, I am informed, otherwise engaged by the firm.

Miss LAWRENCE: In view of the fact that the medical referee for the district did not confirm the decision of the certifying surgeon, and that the certifying surgeon is employed in the manner detailed in the question, does not the right hon. gentleman think that some further inquiries should be made?

Sir W. JOYNSON-HICKS: I have made a very careful inquiry into the position of both these medical gentlemen and their connexion with the firm is very slight, and really, as far as the actual certificate of the medical referee is concerned under the Act that is final, and I have no power to intervene.

Mr. T. WILLIAMS: Is the right hon. gentleman aware that injured workmen practically all over the country have little or no confidence in certifying surgeons who are receiving large fees from employers and then acting for those same employers?

Sir W. JOYNSON-HICKS: In this case the suggestion cannot possibly be made. There is no question of a large fee being received from employers. As far as the general statement made by the hon. Member is concerned, I must really ask him to let me have at least a few of the details of these cases and then I will go into the matter at once, as he has made a very serious charge.

Miss LAWRENCE: I want to ask the right hon. gentlemen whether he has considered the conflicting medical opinions in this case and whether, in view of the conflict of medical evidence, it is not possible to arrange for another examination. The first doctor said that the man had lead poisoning, the second doctor said that he had lead poisoning, but was not disabled, and the third doctor, an independent doctor at the hospital, certified him as actually sound. In view of that conflict of medical opinion cannot the right hon. gentleman have another examination?

Sir W. JOYNSON-HICKS: I will get into communication with the third doctor who the hon. lady says is independent, and ask him to let me have a report on the case. (Cheers.)

Removal of Manchester Tuberculosis Clinic.

Sir THOMAS WATTS asked the Minister of Health if his attention had been called to the objections raised by the residents in the Oxford-road district of Manchester to the proposed removal of the tuberculosis clinic from Hardman-street to that district, and what action he intended to circuiting. There the man and the animal were on a par. They were both under anæsthesia and both felt nothing. The third stage, in some respects the most distressing of all, was that terrible process of building up the man's health after illness, the time of shock, of convalescence. Let them contrast man and animal there. The man might be weeks and months before he was well. In the case of the animal, what happened? They might have an operation on a dog for short-circuiting and the same day it would be playing about with its owner. In the case of an experiment on a monkey, he had himself seen the animal, within 24 hours, sitting on his perch eating a banana. That horrible process of getting well, of recovering from shock, was entirely unknown to the animal. The fact was that it was a slavery of terms. If they read in the papers that one of their lordships had been vivisected and that his appendix had been removed, they would be distressed and horrified; but if they read that he had been operated upon, they would think nothing of it. There was no difference between the one and the other. What had happened to the animal had happened to the man, but what happened to the man was infinitely greater, tenfold or a hundredfold greater, than what happened to the animal. It was necessary to understand what the implication would be if a measure for suppressing experimentation on animals were passed. It would affect the whole range of medicine—the diseases of the gastro-intestinal tract, typhoid, lockjaw—he could go on with a list which would occupy too much of their attention on an afternoon like that. Much of what we knew about gall-stones, dogs had told us. Take jaundice, including the malignant jaundice of dogs. Whereas at one time a dog stricken with malignant jaundice nearly always died, since the discovery of trypan blue the majority of dogs stricken with this disease were saved. In the investigation of disease that animal had to be used which the particular problem required. For instance for the investigation of infantile paralysis, the monkey was the only animal which it was of use to employ. Again, take the case of tetanus. He would not wish that anybody should repeat the war-time experience what that terrible disease was.

Inconsistency of Antivivisectors.

It was important for people to know the consequences of removing from medicine all these results based on experimentation on animals. They had only got to be understood by the public, and then he had no doubt what the public would say. This result would have happened long ago but for the fact that the propagandists against vivisection were not themselves subject to their own gospel. If a propagandist against vivisection was stricken with any of those diseases, he gave an implicit, if not an explicit, consent to vivisection. If those who were against all experimentation on animals were, in their own persons or in their own families afflicted with disease, did their lordships for one moment suppose that they did not adopt the remedies which were based on experimentation? He could assure them that with few exceptions they did adopt them; and was it to be wondered at? Imagine the crisis of love and life in the balance, the crisis of anxious illness. At such a time the theories of the comfortable armchair gave place to more commonsense and reasonable ideas.

He would not be hard on their inconsistencies. Life would be a drab and dreary business if we were always consistent. If the uses of new drugs could not be worked out on animals, the alternative was to work them out on human beings. Perhaps Lord Banbury would form a band of people of conscientious convictions who would allow the medical profession to work out new drugs on them! When it came to working out new drugs like *pituitrin*, *adrenalin*, and digitalin, the question was whether it was better to work them out on animals before they transferred their [illegible] to human beings. He would not say anything against inconsistency if in the hour of trouble the philosophy of antivivisection broke down. He would think humanly of that, but what surpassed the limits of tolerance was that these people could get these remedies when they liked, and yet they were constantly disturbing the minds of unknowing and innocent people in our hospitals.

Hospital Difficulties.

All hospitals in this country were up against the difficulty of getting funds at the present time. They made an appeal in their distress and then along came these fanatical people. They put advertisements in the daily press, they inveighed against the hospital, they sent letters to all the subscribers, and they did their best to spoil the appeal for funds. They appealed to the ignorant and the unknowing by misrepresentations which might be called gross, and by that means they were destroying the flow of charitable funds. Yet let one of these propagandists himself be ill and all he had to do was to go to a private doctor and not suffer at all. They might take it that that was the general rule. He would give an example. They had the terrors of lockjaw in the war, when they found people dying of convulsions which could only be described as agonising, because they were convulsions right up to the point of death, and consciousness was preserved up to the point of death. They adopted the plan after most interesting investigations of using a serum against lockjaw. The effect on the mortality from tetanus in the war was that it came down to quite small proportions. Since the war it had been the rule for all well-ordered hospitals to have constantly in stock antitetanic serum, because street accidents were brought in from time to time, and it was the rule that directly a street accident was brought in antitetanic serum was injected. That was contrary to the principles of the antivivisectionist. There was a hospital in London where they would not use antitetanic serum. A street accident was brought in and they refused to give the serum and the patient died of lockjaw. What was more, two other patients subsequently died of lockjaw at this hospital; and they called that hospital a charity! He called it a place for propagandism and nothing more, and he hoped that King Edward's Fund would take note of this episode and would not give that hospital a certificate that it was a charity ready to treat the maimed and the wounded by the best methods known to science at the present time. At the same time as these poor people—the workers, who had no choice where they should be taken—were taken to this hospital, would the governors of the hospital or their children if they got an injury in a street accident go without antitetanic serum? Not at all; they would go home and call in their private doctor and it would be given. The fact was that it was an impossible situation. What it amounted to was that these people were practising their theories on the dog, only this time it was the human dog, and the world suffered thereby. He put it to their lordships that the health of the nation was a momentous matter not to be treated lightly, but to be treated seriously, and not made the playing-ground of vain imaginings, of misguided thought, and he asked the House to reject Lord Banbury's amendment.

Discussion on the Bill.

Lord **DANESFORT** asked the House not to allow Lord Dawson on an occasion like that to use the debate for the purpose of justifying the vivisection of stray dogs and introducing a totally irrelevant question into the discussion. He would certainly support the amendment.

The Earl of **STRADBROKE** (Parliamentary Secretary to the Ministry of Agriculture) said the clause under discussion which Lord Banbury desired to eliminate was inserted at the request of and after very long and careful consideration with various associations connected with the protection and care of dogs, and he thought they would agree that the clause as it now stood gave a stray dog a better chance. The societies that came and discussed the question of this clause and agreed upon it were the Royal Society for the Prevention of Cruelty to Animals, the Canine Defence League, the Battersea Home for Lost Dogs, and the Glasgow Dogs Home. Up to the present no objection had been lodged at the Government Department against this clause and therefore it was a surprise that this amendment should have been put down. It was the Government's view that the Bill would be better as it stood.

Lord **BANBURY** said that though he was against dogs being vivisected he was not an antivivisectionist. He did not raise the question. Having been defeated he had not attempted to bring on the Bill again in the House. If a noble lord wanted to buy a dog in a legitimate way the law allowed him to do so, but it was another thing to say that if he (Lord Banbury) lost his dog it was to be a chance for some person who found it to keep it a month and then sell it for vivisection.

The Marquess of **SALISBURY** (Lord Privy Seal) opposed the amendment. He said that if Lord Banbury had proposed to replace the clause with another which would have equally achieved his end and perhaps secured the particular view he held on vivisection, that would have been different, but what he did was to eviscerate from the Bill one of its essential clauses without putting anything in its place.

The amendment to omit the clause was rejected by 33 votes to 5. The Bill was read the third time and passed.

HOUSE OF COMMONS.

WEDNESDAY, JULY 11TH.

Coroners Act, 1887, Amendment.

Mr. **MORRIS** asked leave to bring in a Bill to amend the Coroners Act, 1887. He said that the object of the Bill was to amend Section 4 (3) of the 1887 Act, which related to the power of a coroner's jury to find a verdict of murder against the person accused. Subsection (3) indicated that a coroner's jury had to inquire who the deceased was, how, when, and where the deceased came by his death, and if he came by his death by murder or manslaughter, the persons, if any, who the jury found had been guilty of such murder or manslaughter. This amending Bill would cut out that part of the subsection with such consequential amendments as might be necessary in the remaining parts of the Act which related to the naming of the person found guilty of murder. The coroner's court was a very ancient court, and in the development of its history it had gradually come to occupy a very different position from that which it hitherto occupied in the administration of justice. The object of putting the provision in the Act originally was that the coroner's court was regarded as providing a collateral security for the prevention of crime. To-day, although a coroner's warrant could commit a person for trial and had the effect of an indictment, and was equivalent to the finding of a Grand Jury at the Assize Court, it was the invariable practice—although it was not necessary in law for the accused person to be brought before a magisterial court—for the magistrate to examine the case and come to a decision whether a prima facie case had been made out. It was not therefore necessary in the present circumstances to have an inquiry, especially under the conditions of examination conducted before the coroner's court. There were very strong objections to the present procedure. The coroner's court was not bound by the rules of evidence. Any evidence could be admitted. He was seeking in this Bill to provide that a coroner's jury should be limited to finding the cause of death alone. The Act of 1926 was unsatisfactory. The position was this: If a person had been arrested during the time of the coroner's inquest on a charge of murder the coroner should then suspend the inquest pending the conclusion of the trial. If the magistrates found there was no prima facie case they had a position where there was no conclusion to the criminal proceedings on indictment and the present law left it still open for the coroner to go on with the inquest and for the jury, notwithstanding the fact that the magistrates had thrown out the case, to find the person guilty of murder. That was a very illogical state of the law and for that reason he had brought in this amending Bill.

Leave to bring in the Bill was granted without a division.

Diagnosis of Small-pox Cases.

Mr. GROVES asked the Minister of Health whether, in view of the fact that the cases of small-pox occurring in London at the present time were so mild as to be hardly distinguishable from chicken-pox, and also of the fact that certain medical men believed they were not small-pox at all but alastrim or a new disease, he would issue fresh regulations permitting medical officers of health to leave them in their own homes and not put the patients to the discomfort and the ratepayers to the expense of having them removed to the small-pox hospital.—Mr. CHAMBERLAIN replied: I am advised that the small-pox now prevalent in this country should not be confused with chicken-pox or some new disease, and in view of the risks to the public health which would be involved by its further spread, I am not prepared to countenance the course suggested by the hon. Member.

THURSDAY, JULY 12TH.

Ex-Service Men and Medical Treatment.

Mr. STEPHEN asked the Minister of Pensions what remedy an ex-Service man had when he was recommended by the Ministry for treatment at home by his panel doctor and the panel doctor certified that treatment by the Ministry was necessary.—Major TRYON replied: Where it had been decided that a case was either not eligible for or did not require such a course of treatment as is provided by the Ministry of Pensions the case would fall to be dealt with under the ordinary arrangements available to insured persons under the National Health Insurance Acts.

Mr. STEPHEN: If the Minister decides that treatment is not possible and the man's panel doctor considers that treatment by the Ministry is necessary what step has the man then to take?

Major TRYON: It is quite clear that the Ministry cannot accept the doctrine that a panel doctor can decide for them. If the man has a grievance against the panel doctor the normal course would be for him to make an application to the insurance committee.

Mr. STEPHEN: But supposing the man has no grievance against his panel doctor; supposing that he considers that the advice of his panel doctor is right, is there not a medical referee whose opinion the Ministry and the panel doctor can be asked to accept? If there is not, will the Minister set up such a referee?

Major TRYON: No, Sir. The ordinary course must be followed. The case would be considered by the doctors of the Ministry of Pensions whose opinions must necessarily decide the action to be taken by the Ministry.

Mr. STEPHEN: Does the Minister say that the doctors of the Ministry must be the final arbiters in spite of the fact that equally eminent or more eminent medical men may say that the man ought to have treatment?

Major TRYON: No, Sir. The point is that the Ministry of Pensions must decide its own policy and not the panel doctor.

Mr. HARRIS: When doctors disagree would it not be possible to have an independent opinion from a specialist, because it is notorious that doctors often differ on medical points?

No further answer was given.

Medical Certification in a Case of Lead Poisoning.

Miss LAWRENCE asked the Secretary of State for the Home Department if his attention had been drawn to the case of Reginald Aubrey Wild, who contracted lead poisoning while working for Messrs. Locke, Lancaster, and W. W. and R. Johnson and Sons, Limited, of Millwall; whether he was aware that on application to the certifying surgeon for a certificate the same was refused, the certifying surgeon being the same doctor that was in the service of the employers; that the medical referee for the district, who formerly was the employer's doctor, had given a decision that the man was suffering from lead poisoning, but that he was not disabled; and whether, seeing that Mr. Wild was an in-patient in the London Hospital, suffering from lead poisoning, from April 20th until May 14th, after receiving a week's notice on April 15th, he would arrange for the man to be examined by a medical referee attached to another district as, until he was certified, no claim could be made for compensation.—Sir WILLIAM JOYNSON-HICKS replied: The decision of the medical referee under the Act is final, and I have no power to intervene in the manner suggested. I am, moreover, satisfied on inquiry that this case has been most carefully and conscientiously dealt with both by the certifying surgeon and by the medical referee, and I strongly deprecate the implication that these gentlemen, both of whom are medical practitioners of high standing, may have been influenced in carrying out their statutory duties by their connexion with these works. The certifying surgeon is responsible in his official capacity for the periodic examination of workers employed in lead processes under the Lead Compounds Regulations; he also, I understand, periodically examines the other workers and examines workmen newly employed, but has no other interest in the firm. The medical referee used to carry out some three years ago the periodic examinations required by the regulations, but he did this under special appointment from the Chief Inspector of Factories, and he was not, I am informed, otherwise engaged by the firm.

Miss LAWRENCE: In view of the fact that the medical referee for the district did not confirm the decision of the certifying surgeon, and that the certifying surgeon is employed in the manner detailed in the question, does not the right hon. gentleman think that some further inquiries should be made?

Sir W. JOYNSON-HICKS: I have made a very careful inquiry into the position of both these medical gentlemen and their connexion with the firm is very slight, and really, as far as the actual certificate of the medical referee is concerned under the Act that is final, and I have no power to intervene.

Mr. T. WILLIAMS: Is the right hon. gentleman aware that injured workmen practically all over the country have little or no confidence in certifying surgeons who are receiving large fees from employers and then acting for those same employers?

Sir W. JOYNSON-HICKS: In this case the suggestion cannot possibly be made. There is no question of a large fee being received from employers. As far as the general statement made by the hon. Member is concerned, I must really ask him to let me have at least a few of the details of these cases and then I will go into the matter at once, as he has made a very serious charge.

Miss LAWRENCE: I want to ask the right hon. gentlemen whether he has considered the conflicting medical opinions in this case and whether, in view of the conflict of medical evidence, it is not possible to arrange for another examination. The first doctor said that the man had lead poisoning, the second doctor said that he had lead poisoning, but was not disabled, and the third doctor, an independent doctor at the hospital, certified him as actually sound. In view of that conflict of medical opinion cannot the right hon. gentleman have another examination?

Sir W. JOYNSON-HICKS: I will get into communication with the third doctor who the hon. lady says is independent, and ask him to let me have a report on the case. (Cheers.)

Removal of Manchester Tuberculosis Clinic.

Sir THOMAS WATTS asked the Minister of Health if his attention had been called to the objections raised by the residents in the Oxford-road district of Manchester to the proposed removal of the tuberculosis clinic from Hardman-street to that district, and what action he intended to take.—Mr. CHAMBERLAIN replied: The answer to the first part of the question is in the affirmative. I proposed to arrange for a local inquiry before coming to a decision on this proposal.

Mr. HORE-BELISHA: Is it not a fact that in the debate in this House the unanimous view was expressed that this appeal tribunal should be established, and has the hon. and gallant gentleman considered this matter since that debate?

Lieut.-Colonel HEADLAM: I should dispute the fact that the opinion of the House was unanimous on that subject, and it is since that date that the decision has been arrived at.

Commander WILLIAMS asked what was the sickness in respect of which most of these people were invalided out?

Lieut.-Colonel HEADLAM: I cannot say off-hand, but I should say that it was tuberculosis.

Mr. HAYES: Was the matter considered by the Board of Admiralty or by an independent medical board?

Lieut.-Colonel HEADLAM: The Board of Admiralty considered the subject and consulted an independent medical board on the whole subject—not as to the tribunal, of course.

Compulsory Registration of State Nurses.

Mr. ERNEST BROWN asked the Minister of Health if it was the policy of the Government to make State registration compulsory for hospital nurses in Government establishments.—Mr. CHAMBERLAIN replied: The only Government establishment where nurses are employed for which I am responsible is the Rampton State Institution for Mental Defectives. So far as that establishment is concerned the answer to the question is in the negative.

MONDAY, JULY 16TH.

The Rating of Hospitals.

The House considered the Rating and Valuation (Apportionment) Bill on Report.

Mr. HARRIS moved a new clause providing that the expression "hospital hereditaments" should mean a hereditament occupied and used as a hospital, but should not include a hospital run for private profit or gain. He said that the work of the hospitals was an industry which had suffered severely since the war. During the last few years the strain on the voluntary system had been almost at breaking-point. Masses of people were implored to give money to the voluntary hospitals, and then it was handed back to the ratepayer in the form of taxation. Rates on the hospitals were tantamount to a tax on benevolence, on the sick poor, and on medical science.

Mr. CHAMBERLAIN (Minister of Health) pointed out that the Bill was not a plan for reconsidering the whole system with a view to deciding what kind of property might with advantage be relieved of rates. It was a special proposal which the Government were making for the stimulation of industry, and it was a far-fetched suggestion, indeed, to attempt to bring hospitals within the definition of industry. Although he had expressed a certain sympathy in this matter, he did not wish to be taken as having said that he was in favour of any particular scheme for derating hospitals. If the question were to be considered, they could not stop at hospitals. There were other kinds of property for which arguments on similar lines could be properly made, and he did not wish to be taken as having accepted the principle, as he had not given the question that consideration which would be necessary before he expressed a definite opinion. Certainly one recognised that there was a good case for the relief of the voluntary hospital, and with that he must content himself on that occasion. It might be that, on some future occasion, they would have some general scheme which would relieve various classes of property which were rated to-day, and on such a scheme the question of hospitals would properly find a place, but it was not appropriate to discuss it in a Bill designed to find a way to relieve industry.

Sir H. CAUTLEY pointed out that the assessment of the Sussex County Hospital had been put up to ten times what it was before. He hoped that, if he could, the Minister of Health would be able to do something for the hospitals under this Bill, or that he would exert some influence at once to put the provincial hospitals—although it applied also to the London hospitals—on some consistent footing throughout the country. Otherwise a very great number of them would have to shut down, because they could not possibly stand this enormous increase in their assessments.

Mr. GROVES said that if relief could be given to industries, surely the large London hospitals could be assisted. Many of the hospitals had had to close down a number of beds for lack of funds. They ought to make up their minds that the great medical and surgical institutions of the country were industries, because they really were shops wherein the bodies, and sometimes the minds, of the working population were repaired. Hospitals were a necessary adjunct to the industrial life of the community. One sweet thing about the hospitals was that they did not ask what a patient's politics were. In trying to restore people to health they were performing a function which was as essential to the well-being of the country as the work of any industry. He begged the Minister to reconsider his attitude to the amendment.

Mr. E. BROWN said that the amendment was within the scope of the Bill. The great hospitals and infirmaries were vitally linked up with the purposes of industry, and what was true of Glasgow, was true of Edinburgh and Leith, and of all the great cities up and down the country.

Dr. VERNON DAVIES said that he would have been very pleased if he could have accepted the arguments of the Opposition in favour of the amendment, but he could not persuade himself that the Bill was one for the relief of voluntary hospitals. The argument had been used that hospitals might be regarded as productive, in that they helped to produce medical men and nurses. But where was such an argument to stop? They might have relief of rates for theological colleges because they produced clergymen, and for political colleges because they were producing politicians. The question of the relief of hospitals was an entirely different one, and he did not see how it could come under this Bill, much as he would like it to do so, because the hospital question at present was undoubtedly serious. He believed that the Minister of Health had that fact well before him and was as anxious as anyone to deal with it. Attempts had been made to prove that breweries, which were to be relieved of rates, were a prolific cause of work for the hospitals. That might have been so in the past. In the old days it was not an uncommon thing to have patients in the hospitals as the result of alcoholic excess, but it was well known that there had been a great reduction in disease due to such excess. In his student days it was quite a common occurrence to come across cases of what were called "beer drinkers' heart," but at present they were the greatest rarities in clinical medicine. He believed, also, that cases of cirrhosis of the liver were markedly decreasing.

Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) asked the House to reject the amendment. He said that the voluntary system so far as the hospitals were concerned was not fading away but was very firmly based. A great measure of the support came from the workers concerned. Everyone would be glad to assist the voluntary system, but they had to consider whether this was an appropriate place to do so. This derating plan was a scheme to help productive industry and, if possible, lessen the burden of necessitous areas. So far as the voluntary hospitals were concerned, the Central Valuation Committee had made some valuable suggestions. If their advice was followed it would do away with many difficulties.

The clause was negatived by 219 votes to 110—majority 109.

TUESDAY, JULY 17TH.

Wireless for Medical Service in Shetland.

Sir ARCHIBALD SINCLAIR asked the Postmaster-General whether experiments in the establishment of communication by wireless between the island of Foula and the mainland of Shetland for medical service purposes had proved to be successful; and if so, whether, in view of the need for the improvement of communication, particularly on the ground of public health, between the island of Stroma and the mainland, the Government would consider making similar arrangements for the installation of wireless telephony on this island.—Sir W. MITCHELL-THOMSON replied: So far as I am aware, no experiments in the establishment of wireless communication between Foula and the mainland for medical purposes have yet taken place; and the second part of the question does not therefore arise.

Woman Lunacy Commissioner in Scotland.

Viscountess ASTOR asked the Secretary of State for Scotland what were the duties allocated to the lady assistant commissioner employed under the General Board of Control for Scotland.—Sir J. GILMOUR replied: The normal duties of the lady deputy commissioner consist of visiting lunatics and mental defectives under guardianship in private dwellings throughout Scotland. Occasionally she inspects lunatic wards of poorhouses.

Royal Commission on Local Government.

Mr. CRAWFURD asked the Minister of Health when the Report of the Royal Commission on Local Government was likely to be presented.—Sir KINGSLEY WOOD replied: It is understood that the Royal Commission hope to present a Report on certain questions within their terms of reference towards the beginning of November.

ENLARGEMENT OF ST. MARY'S HOSPITAL, PADDINGTON.—Lord Iveagh last week opened an extension which includes 60 additional beds and two operating suites, together with many domestic and sanitary improvements. The cost has been £60,000, of which £52,000 has been subscribed.

Medical News.

UNIVERSITY OF OXFORD.—At recent examinations the following candidates were successful in the undermentioned subjects:—

B.M. AND B.CH.

Medicine, Surgery and Obstetrics.—O. A. Beadle, M. V. Bhajekar, W. H. Brown, T. L. Davies, E. R. Holiday, A. J. Leslie-Spinks, J. M. A. Melly, A. E. Porritt, L. T. Ride, H. G. Wells, Florence H. Johnson, and Alice D. K. Peters.

Pathology.—A. D. Bell, T. M. Gledhill, R. D. Harding, H. C. Harley, Eugene Harvey, Francis Hawking, E. R. Holiday, K. N. Irvine, J. M. Lees, A. W. D. Leishman, J. C. Nicholson, N. C. Parfit, A. B. Stokes, R. L. H. Townsend, W. B. Williams, and Ruth Sandeman.

Materia Medica.—H. J. B. Atkins, F. W. Brown, N. P. Bruce, T. M. Davie, R. D. Harding, J. H. Hunt, J. E. Jenkins, C. J. King-Turner, J. C. Leedham-Green, A. W. D. Leishman, R. C. MacKeith, J. N. O'Reilly, R. S. B. Pearson, B. T. Squires, A. B. Stokes, W. S. Tegner, H. A. Treble, H. C. Wadge, Olive M. Capper Johnson, Winifred Mercer, and Elspeth W. Smellie.

Forensic Medicine and Hygiene.—M. V. Bhajekar, George Campbell, B. R. Caygill, R. M. J. Harper, E. R. Holiday, F. G. Parker, H. G. Pritchard, C. R. Salkeld, D. C. Shields, Florence H. Johnson, Caroline E. MacNeice, Alice D. K. Peters, and Joyce Wright.

The Master and Fellows of University College have awarded the Radcliffe Scholarship in Pharmacology to H. J. B. Atkins and J. H. Hunt. The Theodore Williams Scholarship in Pathology has been awarded to Frank Williams.

UNIVERSITY OF CAMBRIDGE.—At recent examinations the following candidates were approved:—

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

Part II.—Edwin Amarasinghe, Oliver Chance, J. C. Coutts, F. J. Farr, D. L. Greig, D. A. Imrie, Leila K. Keatinge, D. F. Lawson, C. J. R. Morrison, H. C. Pillsbury, B. K. Roy, Tokue Takahashi, Edgar Thorpe, E. J. E. Topham, J. D. H. Wearing, and F. G. Wood.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At the quarterly meeting of the Council held on July 12th Sir Berkeley Moynihan was re-elected President and Prof. W. Hey Groves and Mr. V. Warren Low were elected Vice-Presidents for the ensuing collegiate year. Mr. F. J. Steward, Prof. L. P. Gamgee, Mr. R. G. Hogarth, and Prof. R. E. Kelly, the newly elected members of Council, were introduced, and having made the necessary declarations took their seats in the Council. Mr. D. K. Cassels, M.A., who has been Assistant to the Secretary since 1924, was appointed Assistant Secretary to the College.

The following professors and lecturers were elected for the ensuing year:—

Hunterian Professors.—Sir Arthur Keith, Mr. Arthur H. Evans, Prof. G. E. Gask, Prof. C. A. Pannett, Mr. R. J. M. Love, Mr. C. P. G. Wakeley, and Mr. R. T. Payne.

Arris and Gale Lecturer.—Mr. Henry Albert Harris.

Erasmus Wilson Lecturers.—Mr. T. W. P. Lawrence and Mr. C. E. Shattock.

Arnott Demonstrator.—Sir Arthur Keith.

Diplomas of Member were conferred upon the following who have passed the necessary examinations and have complied with the by-laws: Nellie Brown, Westminster; H. G. Nimbalker, Bombay, Sheffield, and Middlesex.

The diploma of Fellow was also conferred upon J. C. B. Allen, Sydney, Guy's, and St. Bart.'s.

Licences in Dental Surgery were conferred upon the following candidates who have passed the requisite examinations and have complied with the by-laws of the College:—

D. B. Bergh, Guy's; S. Borson, London; D. J. Bull and S. G. Caston, Guy's; R. E. Clarke and Dorothy G. Coutts, King's Coll.; A. H. Crowley and E. M. Douglas, Guy's; D. H. A. Edmondson, Liverpool; W. Foster, Guy's; G. Gilol, Royal Dental; J. W. H. Jones, C. L. Knight, and H. M. Norman, Guy's; W. O'Reilly and D. V. Pandit, Univ. Coll.; H. J. Phillips and R. A. Phillips, Bristol; C. W. Pound, Guy's; R. A. Richardson, Royal Dental; D. E. C. Robertson, Guy's; W. S. Ross, Royal Dental; C. Seller, London; W. H. Shrigley, Guy's; R. S. Taylor, Royal Dental; F. C. Tomlyn, Guy's; F. Trainin and J. N. van der Merwe, Royal Dental; F. W. Walder, Univ. Coll.; W. J. Watson and G. H. S. Weir, Guy's.

The under-mentioned diplomas were conferred (jointly with the Royal College of Physicians) upon the following candidates:—

Diploma in Laryngology and Otology.—J. Acomb, N. Attygalle, H. K. Basu, N. E. H. Box, C. H. Carroll, G. D. Malhontra, T. G. Millar, A. A. Miller, G. W. Morey, W. J. Robertson, E. M. Steel, D. B. Sutton, and M. R. Wadia.

Diploma in Psychological Medicine.—Norah A. Haworth, R. Levinson, Agnes M. Macgown, J. J. B. Martin, A. Pool, and G. M. Tothill.

UNIVERSITY OF LEEDS.—At recent examinations the following candidates were successful:—

M.D.

A. Cannon, H. Sugare, and Gretta M. Wardle.

FINAL EXAMINATION FOR M.B., CH.B.

Part II.—S. G. Bedford, S. K. Foster, W. Greaves, Dorothy Halstead, P. Hampshire, L. B. Heseltine, C. R. Hiley, H. Hopkinson, J. R. O'Neill, T. L. Owen, N. Pyecroft, Doreen M. Robertshaw, Mary G. Shawe, L. Silman, L. Smith, J. O. Terry, Ivy R. Watson, and J. E. H. West.

Part III.—*L. Brill, *L. B. Heseltine, *J. H. Kahr, *V. P. Squire, C. R. Adgie, D. W. E. Burridge, H. W. Davis, L. Godlove, R. C. Hanson, A. Milner, J. P. O'Donnell, J. R. O'Neill, A. Reichlin, and J. E. H. West.

* Second-class honours.

D.P.H.

H. M. Holt.

FINAL EXAMINATION FOR L.D.S.

Part II.—W. Bedford, B. Taylor, and S. R. Woodcock.

UNIVERSITY OF LIVERPOOL.—At a graduation ceremony on July 7th medical degrees were conferred on candidates whose names appeared in our last issue (p. 100) as having passed the requisite examinations. The Ethel Boyce Fellowship in Gynæcology was awarded to Dr. Gwyneth Griffith; the Robert Gee Fellowship in Human Anatomy to Dr. E. N. Wardle; the J. W. Garrett International Fellowship in Bacteriology to Dr. J. S. Logan; the Holt Fellowship in Pathology to Dr. J. F. Galloway; the Holt Fellowship in Physiology to R. K. Bowes; the Johnston Colonial Fellowship in Biochemistry to Dr. L. Earlam; the Thelwall Thomas Fellowship in Surgical Pathology to Dr. R. Y. Dawbarn; the Samuels Memorial Scholarships to Dr. A. L. Kerr (Surgery) and Dr. M. M. Datnow (Obstetrics and Gynæcology); the John Rankin Fellowship in Anatomy to Dr. J. B. Rushton; the University Graduate Scholarship in Medicine to J. Libman; and the John Rankin Exhibition in Practical Anatomy to W. S. Diggle and T. L. Hughes.

UNIVERSITY OF MANCHESTER.—Dr. G. H. H. Booth has been appointed Demonstrator in Anatomy.—The Council have adopted regulations for the Dr. Robert Angus Smith Scholarship, which has been founded for the encouragement of research in sanitary science. The scholarship will be offered for the first time in June, 1929.

UNIVERSITY OF BELFAST.—The Senate of the Queen's University have appointed Dr. E. B. C. Mayrs to the chair of pharmacology and therapeutics, and Dr. F. M. Allen to be lecturer in materia medica and therapeutics.

INDUSTRIAL WELFARE SOCIETY.—At a lecture conference to be held by this society at Balliol College, Oxford, from Sept. 7th to 11th, an address on Nervous Disease and its Significance in Industry will be given by Dr. Millais Culpin.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.—An anonymous gift of £50,000 has been received by this Association, as a result of which the total sum collected in connexion with a special appeal exceeds £110,000.

The fourteenth annual conference will be held at the B.M.A. House, Tavistock-square, London, W.C., on Oct. 15th and 16th. Sir Arthur Stanley will preside, and the subjects of discussion will include the Occurrence of Tuberculosis among Primitive Peoples and the Principles underlying a Scheme of Antituberculosis Measure in Any Country. A number of Canadian tuberculosis officers visiting Europe will attend the conference and take part in the discussions. The sessions will be open to all persons interested in tuberculosis on payment of a fee. Names should be sent as soon as possible to the secretary, at 1, Gordon-square, London, W.C. 1.

WILLIAM HARVEY AND ABERDEEN.—At the June meeting of the Aberdeen Medico-Chirurgical Society Dr. Thomas Fraser took the chair, and Prof. J. MacWilliam, F.R.S., gave an address entitled "Reflections on Harvey's Work." He laid stress on the profound significance of Harvey's great achievement, not only in its obvious applications of fundamental importance in physiology and medicine, but also for the change which it led to in the general attitude of mind towards the problems of the animal organism, introducing a new spirit and method into the study of their relation to the forces and processes of the external world. Dr. W. Clark Souter read a paper on the visit to Aberdeen of Dr. William Harvey in 1641, when he was made an honorary burgess of the city. Dr. Souter showed a number of lantern slides on this and other Harveian topics, and a series of portraits of Harvey, giving his views on the authenticity and origin of the Harvey portrait in the society's possession, a gift from Sir Walter Farquhar in 1915.

MEMORIAL TO A LEEDS SURGEON.—A bas-relief to the memory of Lieut.-Colonel Harry Littlewood has just been unveiled at Leeds General Infirmary, of which he was surgeon from 1893 to 1921. It has been subscribed for by his colleagues, who have also contributed to the equipment of the instructional block at the infirmary. The portrait represents him in his uniform as administrator of the Second Northern General Hospital at Beckett's Park during the war. Colonel Littlewood had retired when the war broke out, and his war-time labours are believed to have shortened his life.

BIDDULPH GRANGE ORTHOPÆDIC HOSPITAL.—In June, 1924, the Prince of Wales opened Biddulph Grange, in North Staffordshire, as an orthopædic hospital for the county, but within less than a year it had to be closed for lack of financial support. It was subsequently purchased by the Lancashire County Council for a similar purpose, and has just been formally opened. The institution is intended to serve the Manchester area, from which it is no farther distant than if it were in some suitable part of Lancashire itself. There is accommodation for 85 children, and the building can readily be enlarged.

HOSPITALS IN CEYLON.—At present modern hospital facilities in Ceylon are obtainable only at the great Colombo General Hospital of some 700 beds. A committee appointed by the Executive Council of the island, which has been considering the situation, recommends that central hospitals should be established at Kandy, Galle, and seven other out-stations, and that, save in exceptional cases, no small hospitals should be maintained. It is further recommended that there should be an increase in the number of itinerant medical officers so that first-class surgical and medical resources should be available all over the island.

BEIT MEMORIAL FELLOWSHIPS FOR MEDICAL RESEARCH.—At a recent meeting of the trustees Mr. W. G. A. Ormsby-Gore, M.P., Under Secretary of State for the Colonies, and the Earl of Onslow, Under Secretary of State for War, were appointed trustees in place of the late Sir Arthur Shipley, F.R.S., and the late Lord Cave. Sir James Kingston Fowler (hon. secretary) began his report by referring to the election of Dr. David Keilin—who had been the first student to hold successively Junior, Fourth Year, and Senior Beit Fellowships—to be an F.R.S. It was now very difficult, he said, to describe the work of the Fellows on medical and allied sciences in a form intelligible to those not engaged in them; but an exception might be made in the case of Dr. Edward Hindle's research on yellow fever. Dr. Hindle, who was appointed last year to the newly established Beit Fellowship in Tropical Medicine, began work in January, and "in the short period which has since elapsed has obtained results in the course of a research on yellow fever which give good ground for the belief that a vaccine has been discovered which will afford protection against that disease." He has shown "that a vaccine prepared from the livers of infected monkeys will protect a monkey from the effects of a dose of the virus ten thousand times as great as the fatal dose, and the monkey continues to be healthy and lively." It has still to be ascertained, said Sir James, what are the best methods of preparing and of administering the vaccine; what is the dose necessary to afford protection; how long the protection will last; and whether the results obtained with monkeys are also true of man.

It was stated that Mr. Alan Sterling Parkes, D.Sc., and Miss Honor Bridget Fell had been promoted from Fourth Year Fellowships to Senior Fellowships. The following appointments to Junior Fellowships are announced for research into the subjects indicated:—Juda Hirsch Quastel, D.Sc. Lond., Fellow of Trinity College, Cambridge: extension of work on the chemistry of bacteria and of complement fixation. Percival Walter Clutterbuck, Ph.D. Manch., F.I.C., assistant lecturer in chemical physiology in the University of Birmingham: nature and function of the succinoxydase system of muscle and investigation of the enzymic systems concerned in carbohydrate metabolism. Bryan Harold Cabot Matthews, B.A. Camb., at present demonstrating in physiology at the University of Cambridge: conduction in sensory nerve-fibres, and the characteristics of sensory end-organs. Douglas Roy McCullagh, M.Sc. Manitoba, at present working at the Sir W. Dunn Institute of Biochemistry, Cambridge: studies in carbohydrate metabolism. Wallace Russell Aykroyd, M.D. Dub., now doing research in the School of Physiology, Trinity College, Dublin: an inquiry, at the Lister Institute, London, and in Newfoundland, into deficiency diseases and their relation to diet.

Correspondence concerning the Fund should be addressed to the hon. secretary at 35, Clarges-street, London, W.

"RE-ENDOWMENT" OF GUY'S HOSPITAL.—The treasurer's annual report states that "the time has come for the re-endowment" of the hospital, the adverse balance of income and expenditure having steadily accumulated, till it now exceeds £100,000. "The great success of the hospital during two centuries has very largely sprung from the freedom from financial anxieties of her administrators," and the governors feel that the position must be faced. Re-endowment, it is pointed out, involves the provision of half a million of money, which "constitutes a very serious call to the wealthy." Meanwhile it is recorded that the reconstruction of certain wards has been completed, and that 10 per cent. has been added to the accommodation. Last year 10,795 patients passed through the wards, which caused an appreciable reduction in the waiting list. The average stay of each patient, both medical and surgical, was reduced by rather more than a day. Out-patients made the enormous total of 537,676 attendances, at a cost of 1s. 7½d. per attendance. The provision of the new out-patient department is being delayed by difficulties in clearing the site for the extension.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham.

MONDAY, July 23rd.—2.30 to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, July 23rd.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: [illegible] Wards.

TUESDAY.—10 A.M., Medic[illegible] Shaw: 2 P.M., Mr. Addison: [illegible] Medical Out-patients.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. [illegible] 2 P.M., 10 A.M., Dr. Owen: [illegible] Dr. Scott Pinchin: [illegible]ological [illegible]

THURSDAY.—10 A.M., I[illegible]rations. Department. 2 P.M., [illegible] Genito-Urinary Department. 2 P.M., Mr. MacDonald: [illegible] Medical Wards. 12 noon,

FRIDAY.—10 A.M., D[illegible] 2 P.M., Mr. Dr. Ironside: [illegible] Sinclair: Surgic[illegible] Nose and Ear

SATURDAY.—9 A.M., [illegible] Operations. 10 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily 10 A.M., to 5 P.M., Saturdays 10 A.M., to 1 P.M., Medical, Surgical and Special Departments. Operations, Anæsthetic Course, &c.

ST. PAUL'S HOSPITAL, Endell-street, W.C.

The Lecture arranged to be given by Sir Thomas Carey Evans on July 26th, has been indefinitely postponed owing to his unavoidable absence from London.

Appointments.

GOUGH, J. H. Harley, L.R.C.P. Lond., M.R.C.S., has been appointed Honorary Assistant Surgeon to the Ear, Nose and Throat Department of the Royal West Sussex Hospital, Chichester.

MURPHY, D., M.B., B.Ch. N.U.I., Medical Examiner of Emigrants, Canadian Government.

SHARP, C. G. K., M.D., Ch.B. Leeds, School Oculist, West Riding.

THOMPSON, J. A., M.B., Ch.B. Edin., Medical Inspector, West Riding Schools.

WHITE, C. F., M.B., Ch.B., D.P.H., Medical Officer of Health for the Port of London.

Vacancies.

For further information refer to the advertisement columns.

Bangor, Carnarvonshire and Anglesey Infirmary.—H.S. £200.

Bath, Royal United Hospital.—Asst. H.S. £100.

Birmingham, Birmingham and Midland Ear and Throat Hospital. 2nd H.S. At rate of £150.

Birmingham, Children's Hospital.—Res. M.O. £175. Also Cas. O. £250.

Birmingham University.—Walter Myers Travelling Studentship. £300.

Blackburn County Borough.—Asst. Dentist. £475.

Bradford, Royal Eye and Ear Hospital.—Res. H.S. £120. Also H.S. £120.
Cambridge, Addenbrooke's Hospital.—H.P. At rate of £130.
Chesterfield, Chesterfield and North Derbyshire Royal Hospital.—Cas. H.S. At rate of £100.
Dublin, St. Vincent's Hospital.—Hon. Asst. Surgeon.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.
Exeter, Royal Devon and Exeter Hospital.—H.S. At rate of £130.
[illegible] *pital.*—Jun. Asst. M.O. £300.
[illegible] District M.O. Also Public Vacci-
[illegible] pectively.
Hastings, Royal East Sussex Hospital.—Hon. Surgeon.
Hertford, Hertford County Hospital.—H.P. At rate of £150.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150.
Liverpool, Liverpool and District Hospital, &c.—H.P.
Liverpool University.—Alfred Jones Chair of Tropical Medicine. £1000.
Liverpool, Walton Institution, Rice-lane.—Res. Asst. M.O. £200.
London Hospital Medical College, Mile End, E.—Assistantship in the Department of Physiology. £400.
Maidstone, Kent County Mental Hospital.—Med. Supt. £1000.
Maidstone, Kent County Ophthalmic and Aural Hospital.—Aural H.S. At rate of £200.
Mexborough, Montagu Hospital.—Hon. Supervisory Radiologist.
Newcastle-on-Tyne, Royal Victoria Infirmary.—Res. M.O. £250. Also Surgical Reg. At rate of £100.
Northampton, County Borough.—Asst. M.O. £600.
Norwich, Norfolk and Norwich Hospital.—H.S. £120.
Nottingham General Hospital.—Res. Cas. O. At rate of £200.
Oldham, County Borough.—Asst. Schools M.O. £600.
Preston and County of Lancaster Royal Infirmary.—H.P. and H.S. £190 and £150 respectively.
Queen's Hospital for Children, Hackney-road, E.—Cas. O. At rate of £100.
Richmond, Surrey, Royal Hospital.—Hon. Asst. Radiologist, also Jun. H.S. £100.
Rotherham, Rotherham Hospital.—H.P. £180.
St. Mary's Hospital for Women and Children, Plaistow, E.—Res. M.O. At rate of £175.
Scarborough, Scarborough Hospital and Dispensary.—Two H.S.'s. Each at rate of £126.
[illegible] *rmary.*—H.S. At rate of £160.
[illegible] *ndon.*—Examiner in Midwifery.
[illegible] *Laboratory.*—Bacteriologist. 10 gns. per week.
Taunton, Taunton and Somerset Hospital.—Sen. House M.O. £150.
Woolwich and District War Memorial Hospital, Shooters' Hill, S.E.—Sen. H.S., also H.P. Each at £125.
Worcester County and City Mental Hospital, Powick, near Worcester.—Jun. Asst. M.O. £300.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Linlithgow (West Lothian).

A vacancy for a Medical Referee under the Workmen's Compensation Act, for the district of the Clerkenwell County Court (Circuit No. 41) is announced. Applications from Physicians should reach the Private Secretary, Home Office, Whitehall, S.W.1., not later than August 9th.

Births, Marriages, and Deaths.

BIRTHS.

DUNN.—On July 10th, at Red House, South Farnborough, the wife of Dr. G. Hunter Dunn, of a son.

GRIFFITH.—On July 13th, at Paradise House, Cambridge, the wife of A. Stanley Griffith, M.D., of a son.

MARRIAGES.

HORSFALL—ADAMS.—On July 7th, at the Church of St. Mary the Virgin, Ewell, Thomas Miles Moss Horsfall, M.D., to Phyllis Mary, only daughter of the late Mr. Herbert E. Adams and Mrs. Adams, of Hendford, Ewell, Surrey.

DEATHS.

KAY.—On July 9th, at Lymington, Bt.-Colonel A. G. Kay, R.A.M.C. (retired), aged 74.

KERR.—On July 13th, at 70, Scarisbrick New-road, Southport, Nettie Russell Donald, wife of Dr. James R. Kerr.

NEWBY.—On July 7th at Broad Park-avenue, Ilfracombe, Charles Henry Newby, F.R.C.S. Eng., aged 78.

STAPLES.—On July 11th, at St. Trinian, Walpole-gardens, Strawberry-hill, peacefully in his sleep, Lieut.-Colonel Francis Patrick Staples, R.A.M.C., (retired).

WHITEHEAD.—On July 11th, in London, after an operation, Col. J. H. Whitehead, D.S.O., M.R.C.S., L.R.C.P., of Plains, Natal, S. Africa, aged 58.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET." VOL. I., 1928.

THE Index and Title-page to Vol. I., 1928, which was completed with the issue of June 30th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Notes, Comments, and Abstracts.

THE NATIONAL INSTITUTE FOR THE DEAF.

THE fourth annual meeting of the National Institute for the Deaf was held at the Central Hall, Westminster, on July 17th, when the President, Lord Charnwood, was in the chair. Before the actual business of the meeting commenced, the Chairman voiced the unanimous feelings of those present by expressing the deepest sympathy with the Secretary, Mr. A. J. Story, in his recent bereavement, the sudden death of his wife.

In moving the adoption of the report of the committee. for the year ending March 31st last, Lord Charnwood emphasised the fact that an appreciable number of deaf people would be greatly benefited if facilities for a higher standard of education were provided for them, while the community would also gain. He pointed to the danger that children who were deaf might be classed among the mentally defective, owing to lack of insufficient arrangements on the part of State authorities, and some institution of national scope, he said, was needed to help the deaf after the education period. He referred to his recent effort in the House of Lords, with the support of the Duke of Montrose and the Archbishop of Canterbury, to induce the Government to set up some body to consider the whole question of the education of the deaf, and of their future employment for the good of the community. He hoped for better results in future efforts along this line, and expressed his gratitude to THE LANCET for the way in which it had supported the cause of the deaf.

Mr. Walter G. Yates, the hon. treasurer, then submitted the financial statement for the year ending March 31st. the main feature of which, he said, was that much of the money that had been obtained by special appeal had been used to make up deficiencies, and he pleaded for further donations, as the ordinary income was insufficient to meet expenses. Much propaganda work had to be done, and the results obtained by their small staff were really phenomenal.

Mr. M. Birley, Chairman of the Executive Committee, seconded the adoption of the report and of the financial statement, and the necessary motion was carried unanimously.

The Duke of Montrose said that in the name of social legislation the Government practically fed, clothed, educated, and nursed a large proportion of the people of the country. Something like one person in 30, he understood, was in receipt of State alimony of some kind in the name of social welfare, and he thought the time had arrived when something more should be done for the deaf. The only department of the Government which seemed to be concerned with the deaf was the Board of Education, and they were only interested in the education of children up to 16, or, in some cases, 18 years. It was 40 years since any Government Department had made an inquiry into the position of the deaf, and it was time that there should be an examination as to their welfare. Referring to the debate on Lord Charnwood's motion in the House of Lords for a Departmental inquiry, he stigmatised the proceedings as discreditable to the House, while he advocated the formation of vocational centres for the deaf and the encouragement of craft-work in order that as many deaf subjects as possible—and he thought the number would be very large—might become self-supporting. He moved:—

> "That having regard to the grave social and industrial hardships caused by deafness in the lives of large numbers of adolescent and adult persons who were born deaf or have become so, and to the fact that no official inquiry into the results (in the terms of improved social and industrial well-being) of large public expenditures in their education has ever been held, this meeting is strongly of opinion that the time has arrived when a complete investigation into the conditions and needs of these deaf and dumb and deafened persons should be made.
>
> "And, further, that this meeting urgently calls upon the Government to make such an investigation by means of a Departmental Committee, or otherwise, at an early date."

Colonel F. E. Fremantle, M.P., who seconded the motion, said that something like one-third of the adult population of the country had some difficulty of hearing, so that, apart from the cases with which the National Institute dealt, there was a huge number of people who should be personally sympathetic, and consequently be a potential source of help to the Institute. He quoted statistics which suggested the enormous loss to the country in personnel which defects of hearing caused, and thought that from the economical point of view the country might be losing as much as two million pounds a year through neglecting to employ the deaf suitably. He cited also figures contained in a contribution to THE LANCET by Squadron-Leader David Ranken dealing with the physical examination of airmen, and showing that of the total percentage of rejected recruits from the Air Service for all reasons it might be estimated that aural disease affected 2·8 per cent. of that part of the population likely to present themselves for enrolment. From figures supplied from one particular London school for deaf boys between the years 1902 and 1928, and dealing with 737 boys who had left, he said that 89 per cent. of these were in employment and following a trade which they had learned at school, showing the high degree of efficiency which could follow training. It was obvious that the country ought to go ahead in that direction, and he was glad that the Institute was attempting to take the matter up on a national scale, and obtain the hearing of the Government.

Sir Squire Sprigge moved :—

> "That the best thanks of the meeting be given to the President, the Executive Committee, the hon. Treasurer, hon. Solicitors, hon. Auditors, and to Mr. C. M. R. Balbi, A.M.I.E.E., hon. consulting electrical expert, for their services during the year, and that all these gentlemen be requested to act in their several capacities during the ensuing year."

The motion was carried unanimously and the meeting terminated with a cordial vote of thanks to the chairman and speakers.

FACTORY GIRLS' COUNTRY HOLIDAY FUND.

To the Editor of THE LANCET.

SIR,—Will you once again give us the opportunity of drawing the attention of your readers to this Fund, which may well claim to render good service to our poorer sisters, and so to the whole community. The change wrought in these pale Londoners in a few days is almost incredible, save to the eye-witness. Good food and plenty of it, rest on the beach or in the fresh country fields, and above all, freedom from care—knowing their holiday is paid for before they go—work wonders. There are now hundreds of girls hoping to be sent away during the next few weeks. Fresh applications come in daily, but we have not enough funds to send half the number at present. Many of the applicants have been saving out of their earnings week by week since the beginning of the year, towards their share of the cost of their holiday. Are they to be denied this pittance of a holiday, looked upon by most as a bare necessity? Are they, who for at least 50 weeks of the year have to go to their long and monotonous day's work in all weathers, to be denied health-giving air and surroundings during the other few days? Could your generous readers see, but for a moment, that long procession of hard-working and, alas! often worn, and pale girls coming to pay their savings week by week, for months before their holiday, they could surely not deny them the balance which would make it a certainty. This Fund helps chiefly the poorest class of factory workers, most of them are the main support, too, of their families. Subscriptions and donations will be thankfully received and acknowledged by the hon. treasurer, Mrs. Slater, or Miss Canney, 75, Lamb's Conduit-street, London, W.C. 1.

We are, Sir, yours faithfully,

(Signed) ALBERTA SANDWICH, A. F. LONDON,
MARY SCHARLIEB, J. F. GREEN,
LILIAN BRAITHWAITE, Chairman.

July 16th, 1928.

HEALTH INSTRUCTION FOR MISSIONARIES.

THE fourth edition of a pamphlet entitled "Health Instructions for Missionaries in the Tropics," has been issued by the Association of Medical Officers of Missionary Societies (1, Farnley-road, London, E. 4), price 4*d*. Various additions, including illustrations of some of the disease-carrying insects, have been made since the last edition was published in 1922 and the whole text has been revised. The booklet is intended for study before going abroad, and for reference when in the tropics.

THE ALMONER'S WORK AT AN EYE HOSPITAL.

A SHORT report by the Lady Almoner of Moorfields[1] gives a vivid picture of the routine work in her department. Children with phlyctenular keratitis, blepharitis, or interstitial keratitis who fail to respond to the surgeon's treatment are often found to be living in unhygienic conditions. A prolonged convalescence in a suitable institution often does far more to help them than continued attendance at the hospital. A child may be sent to Mayfield Ophthalmic Convalescent Home where there is skilled ophthalmic nursing, or to Swanley Ophthalmia Schools; in other cases the visits of a district nurse at the home may be effective. Extra food may be required, when the coöperation of a charitable society, such as the Invalid Children's Aid Association, may be applied for. Children suffering from interstitial keratitis may have to be transferred for treatment at one of the V.D. centres. For cases of progressive myopia, the surgeon may recommend either a myope school or "easy treatment" at school. Without the social service worker there would be nobody to see that this recommendation was carried out. Another class of case that needs the help of the social worker is that of the blind or partially blind, for whom surgical treatment can do no more. Even infants under 5 may benefit by a sojourn at a "sunshine home" whence they return not quite so helpless as before. There are schools for the blind for older children, workshops for adults, and pensions for those over 50, and in all these cases the almoner's business is to put the patient in touch with the appropriate voluntary association or Government department. Her work is an essential supplement to that of the surgeon.

PSYCHIATRY IN INDIA.

THE European Mental Hospital at Ranchi has issued a report on its progress from 1924–1926. The number of patients admitted and discharged during the triennium was 199 and 124 respectively, and the total mortality was 22; 16, 9, and 37 voluntary boarders were received in each of the three years. The admission of three mental defectives brought up the question of State care of these children, but the Government decided that it could not yet cope with so vast a problem. The medical superintendent, Lieut.-Colonel O. A. R. Berkeley-Hill, is doing his best to arrange a pioneer institution to take 20 children. The value of occupational therapy for mentally disordered patients is recognised at Ranchi, and special buildings are to be provided for this purpose. A games and sports department is actively at work, and a swimming and boating lake has been constructed by damming a valley in the neighbourhood. A golfer-patient has discovered and laid out a nine-hole course. After-care of discharged patients is a difficult problem in India, but Toc H and the League of Women Workers have rendered invaluable service of this kind in Calcutta. Investigations into the production of aseptic meningitis by injection of horse serum have been carried out with the aid of the dhobi's pony, and will be reported on next year.

We wish Lieut.-Colonel Berkeley-Hill every success in his exacting task.

"MANSON HOUSE."

THE suggestion that Manson House should be the name of the new headquarters of the Royal Society of Tropical Medicine and Hygiene has already given rise to confusion, as the word may be mis-heard as "mansion house." Colonel Clayton Lane's plea that the building should be called "Patrick Manson House" is supported by the fact that we mis-printed "mansion" as "manson" in his last letter (THE LANCET, July 14th, p. 95), thus committing the two possible errors in consecutive issues of this journal. Whilst purists may regard their pronunciation of this inverted shibboleth as beyond criticism, it can evidently cause inconvenience even to those whose intentions are excellent.

CHILDREN AND THE SEASIDE HOLIDAY.

THE problem of the children is always an anxious one for parents, but never is this more so than during the month of August, when the schools are closed and everyone is holidaying. At Hastings the corporation has engaged a staff-sergeant whose duty during August will be to amuse the children on the sands with organised games, and at the same time to give them instruction in physical drill. The value of this excellent scheme is increased by the provision of a tent which will play the part of a creche.

CONFECTIONERY.

THE Chocolate and Confectionery Exhibition, held at Olympia last week, was not without medical interest. Wholesome chocolates and pure boiled sweets can be very useful, as well as popular, prescriptions at the proper time, while toffees and mints play their part respectively in the treatment of pharyngeal cough and minor digestive disorders. Chocolate is a very valuable vehicle for milk, and the bulk of Cadbury's "Dairy Milk" is manufactured in the summer when the milk-supply is ample and irradiated. For those who like a coffee flavour, Terry's new "Café au lait" chocolate can be recommended. De Villars specialise in plain chocolate flavoured with all sorts of surprising things—orange, raspberry, and currant, for instance. Fox's "Glacier Mints" and barley sugar are well known, but not everybody knows that this firm also markets a eucalyptus and menthol sweet for winter colds and throats. Van Houten's cocoa is a household word; their bitter chocolate is an excellent food-medium for those who do not like a sweetmeat. For wholesome assortments, the Dutch firms, such as Dioste and Rademaker, should not be forgotten. This was the first exhibition organised by the chocolate makers alone.

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[1] Royal London Ophthalmic Hospital (Moorfields Eye Hospital), Report of the Samaritan Fund and the Work done in the Social Service Department for the Year, 1927.

An Address

ON

SOME REACTIONS AND A RETROSPECT

Delivered at the Annual Meeting of the British Medical Association at Cardiff on Tuesday, July 24th,

BY SIR EWEN MACLEAN, M.D., F.R.S. EDIN., F.R.C.P. LOND., HON. F.A.C.S.,

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[AFTER reviewing the public work of the Association since it last assembled in Cardiff 43 years ago, the lecturer continued :—]

ANCIENT CYMRIC MEDICINE.

Casting back to more distant times, the exhibit which, by the courtesy of the authorities, has been set up in the Library of the National Museum shows, I think, that "Antient Cymric" medicine affords a most attractive field for study and research, and I am indebted to my friend Dr. Roland Williams for many interesting observations and gleanings in this connexion.

Handed down from very remote times, a glimmering of medical science would seem to have existed in pre-Celtic and Celtic Britain. It is difficult to conceive, for instance, that the new Stone Age and the Bronze Age, rich as they were in the pioneer achievements of civilisation, should have been lacking entirely in some form of indigenous medical lore. Possibly, too, those very early traders from the older Mediterranean civilisations who came to seek tin from Cornwall left behind them something of the healing traditions of other lands. At any rate, however such knowledge may have accrued, there are some grounds for crediting the Druids with perhaps a greater preoccupation with medicine than was usual in a primitive priestcraft. The Greek geographer Strabo (born about 60 B.C.) has left it on record that the "soothsayers are sacrificers and physiologists; the Druids, in addition to physiology, practise ethic philosophy." Pliny gave a brief account of a Druidic *Materia Medica* in which the mistletoe or "All-Heal" was held in highest esteem. Presumably, too, the British Druids were similar in type to the Druids of Gaul, to whose advanced "knowledge of the Laws of Nature" Cicero referred. It is interesting to note that, as preventives to ill health, the Druids prescribed *cheerfulness, temperance, exercise, and early rising*, qualities and practices which—shall we say?—have remained characteristics of the Cymry to the present day. Albeit, another of the Druidical maxims, asserting that "Money lent in this world will be repaid in the next," would not, I fear, in practice to-day, rank as a gilt-edged security.

After the Druids came the Romans. Soldiers, engineers, administrators as they were in the main, we do not know what legacy they left behind them towards the building up of a native medical tradition in Wales, but it is legitimate to surmise that at least some elements of the lore of Hippocrates and the great Greek medical tradition may have made its way into Britain with the legions, and, once implanted there, may have lingered, as the *language* of the legionaries lingered after their departure, in Cornwall, in Cumberland, and in Wales. It is a significant fact that the modern Welsh word for a physician, the word *meddyg*, goes back directly to Roman times, being derived from the Latin *medicus*, and occurring first in its Welsh form in the old Cornish vocabularies.

After Rome, the welter of the Dark Ages—a period dark to the historian everywhere in Europe, but darkened still more in Wales owing to the distrust to which many of the manuscripts relating to the period are subject. Not until the beginning of the tenth century and the codification of Welsh Tribal Law about that time do we come upon reliable information regarding the profession of medicine.

A thousand years ago King Hywel the Good caused the laws of Wales to be codified, and it is in these codes that we get the first authentic glimpses of our profession and the manner of men who practised it in tenth-century Wales. This monarch had a court physician who was given place and prestige in his presence, had a grant of free land and a horse, and received his linen clothing from the Queen and his woollen clothing from the King. His seat in the hall within the palace was at the base of a pillar near to the King, and his lodging was with the chief of the household. It was his duty to administer medicine without charge to all within the palace, and to the chief of the household. It would appear that he was a whole-time officer, with intervals when, on the basis of a moderate tariff, he was allowed to enjoy the stimulating freedom of private practice. He had to accompany the armies, but ordinarily he was never to leave the palace without the King's permission, when he was free to take any road or route with the messenger of the sick. In these days it was lawful for anyone to take another's horse to procure a medical man for a person in danger, without being required to make amends. The same principle applied to-day in respect to motor-cars might lead to serious misunderstandings.

The chief interests of these early codes, from a medical point of view, lies in the way they assessed legal damages for injuries and laid down standard fees for treatment. The thumbnail, for instance, was worth 30 pence. One front tooth was equal to a finger; one molar tooth to a thumb.

MEDIÆVAL TRADITIONS.

The old laws are interesting as showing us something of the state of the Welsh *meddyg* under the Welsh tribal system in the tenth century. The eleventh century brought with it great changes in Welsh history. A great new formative influence came then into the life of Wales—that was the Norman. The Norman affected profoundly the whole course of Welsh life and politics. Under the walls of his castles there grew up townships, markets, forts. Once more, as in the days of the early wandering Celtic missionaries, Wales came into touch with the rest of Europe and the world. For not in Wales and England only, but in Ireland, in France, in Spain, in Sicily, in Palestine even, on the threshold of immemorial East—there too were the castles of the Norman. Pilgrim and Crusader, merchant, monk and friar, errant knight and troubadour, all whose activities helped to render knowledge fluid and international throughout the Holy Roman Empire, must have helped towards the building up of a native medical tradition in mediæval Wales, a tradition which has left behind as its monument a fourteenth century manuscript, the older of the two manuscripts known as the "Books of the Physicians of the Myddfai."

It was but natural that the tradition of the physicians of the Myddfai in mediæval Wales should trace its origin back to the fountain head of a legend.

In the fastnesses of the wild Fan Mountains of Carmarthenshire there is hidden away a small lake known as Llyn-y-Fan Fash. Long ago, so the legend runs, a shepherd boy named Gwyn was tending his flock on the shore of the lake when a most beautiful maiden emerged from the mirrored surface of the water. After many complications, which are so essential to a fairy tale, Gwyn and the maiden of the lake became man and wife. Three sons were born to them, but after a time the maiden disappeared again into the depths of the lake, taking with her her faery dowry of cattle and chattels. At a later day, however, she reappeared to her three sons, who kept vigil for her on the shore. The eldest son, Rhiwallon, she led aside to Pant-y-Meddygon (the Physicians' Hollow); there she revealed to him the properties of the medicinal plants and herbs which grew around them, and called upon him to dedicate himself to the art of healing. This Rhiwallon did, so that he became the physician to Rhys Grug, Lord of Llandovery and Dynevor. Tradition claims, too, that the descendants of Rhiwallon practised their art at Myddfai in unbroken lineage until the end of the eighteenth century.

Such, in brief, is the story of the physicians of Myddfai.

Interesting though these earlier figures may be, however, it is only after the Renaissance had rejuvenated Wales that we come upon the beginnings of a really brood-culture among Welsh physicians. Although not one of the outstanding physicians of Wales in Tudor and early Jacobean times had any claim to be compared to a Sydenham or a Harvey, they were yet figures commanding interest and respect in other ways. Educated, most of them that we know of, at the older English universities, their medical writings and their medical beliefs were, for their day and generation, reasonable and scientific. One striking characteristic which many of them had in common was the great breadth of their culture and their scholarly achievements in other arts besides medicine. Thus Phaer of Pilgeiran was one of the first great Elizabethan translators of the classics, while to Robert Recorde of Tenby we owe the introduction of the study of algebra into this country.

Time does not permit to follow the fortunes of the Welsh *meddyg* through the seventeenth and eighteenth centuries. Something of their ubiquity and prominence may be gathered from the fact that the two surgeons on board Captain Cook's ship the *Resolution* in 1777 were Welshmen—Robert Davies of Wyddgrug, and David Samuel of Denbigh. Samuel later became surgeon of the *Discovery*, and he may have suggested to his captain some of the latter's very enlightened ideas regarding the relationship of scurvy to diet. At any rate, Samuel was a scientifically minded man, as shown by his treatise on the introduction of certain diseases among the South Sea Islanders. "He was," so wrote one of his contemporaries, "extremely irritable, but one of those hearty fellows we expect a sailor to have been."

But however true it may be that the past, even the distant past, is ever with us and must tincture our every thought and deed, the blend of the present and the immediate future is the main incentive to individual and corporate action.

HEALTH ORGANISATION IN RECENT TIMES.

The population of the world to-day is many times greater than it was a thousand years ago, and over the average of years Mother Earth shows no signs of failing to respond to the food and other requirements of her increased family of humans. *Correspondingly*, however, much more work has to be done by these humans in order to extract and prepare these requirements. Effective work involves a sufficient measure of health, and hence, perhaps, one factor at least of the instinctively higher regard for the health of the individual and of the community which is so marked a social feature of the day.

The demand is insistent, and from the nature of the case the supply can never wholly meet it. But quite wonderful achievements have been registered by organisation and scientific discovery. At the same time those who know must know how much more remains to be done.

A sign of the time, that enactment of outstanding importance, the National Health Insurance Act, 1911, which provides domiciliary medical attendance for, say, 16 million of the 45 million of the population, has profoundly modified and to a significant extent refocused the conditions of the great bulk of medical practice in this country.

Piloted with great ability and energy through a half-reluctant House of Commons by Mr. Lloyd George, the then Chancellor of the Exchequer, menaced by vested and otherwise disturbed interests, this colossal measure came into operation in the early days o January, 1913. The unavoidably complex machiner of so far-reaching an Act was but as yet in the stag of graduating through the inevitable jolts and ja when the cataclysm of the great war and the disabilities of demobilisation intervened as a further strai on administration.

It says much for the administrative staff and eve more for the 15,000 medical practitioners acceptin service under the Act that, as set forth in the Memorandum of Evidence submitted by the British Medica Association to the Royal Commission on Nationa Health Insurance, both the Representative Body o the Association and the Conference of Representative of Local Medical and Panel Committees agreed "tha the measure of success which had attended th experiment of providing medical benefit under th National Health Insurance Acts system has bee sufficient to justify the profession in uniting to ensur the continuance and improvement of an insuranc system."

It is demonstrable that insured persons under th Act, taken as a whole, are provided with a bette grade of medical service than were their equivalent before its inception. But of the making of regulation there is no end, and the officials concerned, and *certainly* the busy practitioner, may well be forgive if, on occasion, a lapse of memory leads to executive error. It would be a real boon to the insurance *practitioners, to the officials, and to the insure* persons, and would prevent many mistakes and misunderstandings, if someone—it would admittedl *require little short of a genius*—would *intelligibl* collate the multitude of regulations.

Under the Act as it stands much more could have been done, and should be done, in the *matter* o wise propaganda directed to the means of preserving health and of preventing disease; but, taking the Act in general, with its *many inherent administrative* difficulties, it can be said that the major provisions are being sympathetically and effectively implemented. But the degree of success so *far attained in* itsel calls for further and fuller developments, which in due course should be equally available for all insured *persons regardless of their membership of any* particular society.

Such further provisions should include complete consultant and specialist advice and *treatment*, and, under conditions, nursing and massage. Various salient advances by some of the approved societies have already been made *into the region* of these developments, notably in the form of dental, ophthalmic, or institutional extra benefits, and the experience and results *accruing* will, doubtless, ultimately encourage an advancement of the line, as indicated in recent enactments by Parliament.

In such logical and, indeed, inevitable developments of the health insurance scheme, stage by stage being added after full consideration of the reasonable *interests of those concerned*, I for one fail to see the risk of any sudden ultimate transmutation to a whole-time State medical service, with its connoted and *handicapping officialism* and sacrifice of personal freedom.

[At this point the lecturer briefly surveyed the *advances of medicine and surgery* since the Association last assembled in Cardiff. On the crest of the wave of recent years, he said, ride prominently *the bacteriological and biochemical* discoveries, the latter even overshadowing the former, as witness the new science of the endocrines, the chemistry of *body fluids*, the *functions of organs* as expressed *in their* influence on the composition of the blood—for example, liver, spleen, and, lastly, the *vitamins*. Such a recital, he remarked, provokes the reflection that if one of the old alchemists came to life in our midst *to-day*, after the manner of Rip van Winkle, in all else but technique and terminology he might find himself very much at home. The lecturer then went on to deal with certain developments in present-day practice.]

MATERNAL MORTALITY.

It has been urged, and with truth, that one of the most vitally important branches of medical practice—obstetrics—has not shared in due proportion the benefits accruing from the Listerian epoch with regard to the incidence of infection. Many persons, and many interested bodies, including the Ministry of Health and our Association, have been, in their several spheres, devoting time and earnest attention to the problem, and it is of the first importance that Her Majesty the Queen has personally associated herself with the movement to adequately investigate the governing causes and to endeavour to reduce the maternal mortality and morbidity rates.

No further incentive to this end need be furnished than the oft-quoted facts that more than 3000 mothers lose their lives every year in England and Wales; that in more than half of this number death is due to septic infection which, it is claimed, is, or should be, a preventable condition. Preventable, yes, given certain conditions. It is well known that under properly conducted institutional conditions mortal septic infection arising de novo is reducible to vanishing point. In these establishments the observance of every detail and circumstance of technique designed to secure asepsis can be carried out, and a confidence generated akin to that with which surgery in general is now undertaken.

Inasmuch as, in a country like ours, all cases, or any very considerable proportion of them, cannot be institutionally provided for—the total in England and Wales would require something like 30,000 beds—the problem would appear to be capable of solution if it were possible to reproduce in the homes of the people the essential factors of this provedly effective hospital treatment. This deduction loses little of its force even if it be urged, as with truth it may, that on the one hand there are some rapidly fatal cases of infection in which every known precaution has been taken, and, on the other hand, that some difficult and complicated cases, in the circumstances of which practically no precautions can be observed, may make a smooth recovery. Such cases are the exception and not the rule.

To reproduce, however, in the average home that veritable Temple of Asepsis the operating theatre, with its ministering priests and priestesses, is, of course, impossible. But to be effective the ritual need not be complicated, and the association of antenatal care and, if necessary, treatment; the adequate nursing; the unhurried waiting upon events in suitable cases; and the availability of skilled experience of all kinds if and when required, are equally indispensable elements in the right kind of institutional treatment. There are thousands of general practitioners who, in letter and in spirit and wherever possible, transmute the largest common denominator of these hospital advantages into their practices, and their results attest the fact.

Every practitioner, however, and especially in certain districts, must not rarely encounter such conditions of poverty, ill-housing, previous unskilled interference, and other handicapping circumstances, as render it impossible to practise asepsis, and where accordingly the pathways to infection are hopelessly unguarded. It is gratifying to note that several local authorities are doing much to meet the circumstances of many who cannot afford even a very inexpensive equipment—the maternity benefit notwithstanding—and that the sequel is encouraging.

It is much to be hoped that at no distant date the recommendations submitted by the Association to the Royal Commission on the Insurance Act in regard to this supremely important branch of medical practice will be materialised.

Meanwhile the tendency exhibited in certain quarters to make the general practitioner the scapegoat for the sins of many is to be deprecated. To begin with, he cannot be sent into the wilderness. In his hands, either in the original charge or as a consultant of first instance, must lie the application of the standard obstetrical practice of the day for the great bulk of domiciliary cases. He needs, not blame, but support in the form of the provision of facilities in suitable cases to cope with this most anxious, time-absorbing, underpaid factor of his work. As it is, his devoted response to its calls in most difficult circumstances is worthy of all praise.

There are many aspects of this international problem which are baffling, and one cannot but earnestly hope that the intensified research which is now being directed not only into its bacteriology but also into the question as to the factors which constitute and the conditions which vary resistance to infection, may produce helpful light and leading.

INTERNATIONAL COÖPERATION.

This and many other important topics of international concern are engaging the close attention of the appropriate departments of our annual meeting. Indeed, we are, by the presence with us on this occasion of so many distinguished representatives of other countries and other climes—whom we are delighted to have the privilege of greeting—strikingly reminded of the cosmopolitan character of the science and art of medicine. Orthodox medicine knows no protection barriers and claims no patent rights. The international pooling of ideas, of discoveries, and of experiences is essential to the recognition of even a datum line of the advances in the various departments.

There is an impression abroad—and it is not, perhaps, ill-founded—that in the British Isles we do not sufficiently organise and utilise the wealth of clinical material at our disposal for post-graduate demonstration in the interests of our home profession and of visitors from other countries. Good work has been and is being done in the various metropolitan centres, but these do not claim a monopoly of skill and clinical facilities. I have long felt that, with its wonderfully ramified machinery to link up the provinces and the capital, the rural areas and the towns, no body is so well adapted as our Association to organise a post-graduate system embracing existing institutions and developing many new centres, on a scale worthy of this country.

I am not without hope that there may be forthcoming a national, nay, an international, benefactor willing to entrust the Association, as a voluntary body, with the considerable sum of money necessary to establish and conduct such a system. I am convinced that thus we would not only raise the standard of efficiency, and therefore of health, in this land, but colleagues from overseas and other lands would find it more than ever worth their while to spend some time with us, to our mutual benefit. The advantages would not be limited to our professional spheres, but would surely develop in wider measure social and ethical results of far-reaching significance.

No branch of the League of Nations exerts a wider general influence than the Health Organisation, the head of which, Dr. Rajchman, we are so glad to have with us. That influence is not accidental. It is essential. For may we not, in all humility, venture to claim that no other profession or calling can offer a basis of union so broadly appealing to what is common to mankind as the objective of preventing, alleviating, and curing the diseases of humanity?

A GOVERNMENT HOSPITAL IN LIBERIA.—Mr. King, the President of Liberia, the Negro Republic on the West African coast between Sierra Leone and the French colony on the Ivory Coast, recently opened a Government hospital at Mourovia, the capital. It stands high, is built of stone and concrete, and encircled by wide-covered verandahs. There are 200 beds in small wards and single and double rooms; there are maternity and contagious diseases wards and a pavilion for patients awaiting admission. The hospital is open to patients of any race or colour, and the medical staff is composed of two Europeans and a Liberian, all of whom have been trained in Europe and the United States, and are specialists in tropical diseases. The nurses have been trained in America.

PUBLIC ACTION IN REGARD TO CANCER.*

By Sir GEORGE S. BUCHANAN, C.B., M.D., F.R.C.P. Lond.,
SENIOR MEDICAL OFFICER, MINISTRY OF HEALTH, AND PRESIDENT OF THE CANCER COMMISSION OF THE HEALTH COMMITTEE OF THE LEAGUE OF NATIONS.

We are invited to-day to consider "public action" designed to reduce, in our time, the suffering produced by an ever-threatening disease, to cure it when it can be cured, and, last but not least, to prevent it where knowledge and means are at hand for its prevention. And "public action" for this purpose may be taken to cover every form of collective public effort, whether taken voluntarily, by groups of citizens acting independently of any State medical system, or organised by central or local government authorities out of rates and taxes.

A review of public action, thus conceived, if it were to be just and to take account of the different lines of effort followed in the many countries represented at this Conference, would be a task which is, historically and administratively, far outside my own competence. My best course, I think, will be merely to say a few words as regards this country, and to point to a few of the more recent illustrations which it affords of the benefit which collective action can secure. I will then invite those who come from other lands and work under other conditions of medical practice and public health administration to give us their experience of their own lines of work and help us with support or guidance.

Increasing Recorded Mortality-rate.

For England and Wales, then—from my official limitations I find it easier to deal with this part of the United Kingdom, leaving Scotland and Northern Ireland to their own exponents—I may start by referring to the way in which, in recent years, attention has been directed to the steadily increasing recorded mortality-rate from cancer—a feature which differentiates it from practically all other causes of mortality. It is unnecessary to assume that this recorded increase denotes a corresponding increase in the real incidence of the disease, since it is well known that other factors, such as average increase in longevity, improvement in diagnosis, and improvement in death certification, must all be reflected in the mounting annual figures. Nor will it be forgotten that this over-all increase comprises increases at certain sites of the disease, decreases at others.

But yet consider the following death-rates per million living in England and Wales during the period 1847–1927:—

Certified Deaths per Million from Cancer in England and Wales, 1847–1927.

1847–50 ..	274	1886–90 ..	632	1921 ..	1215
1851–55 ..	306	1891–95 ..	712	1922 .	1229
1856–60 ..	327	1896–1900 ..	800	1923 ..	1267
1861–65 ..	367	1901–05 ..	867	1924 ..	1297
1866–70 ..	403	1906–10 ..	939	1925 ..	1336
1871–75 ..	445	1911–15* ..	1055	1926 ..	1362
1876–80 ..	494	1916–20* ..	1182	1927 ..	1376
1881–85 ..	548	1921–25 ..	1269		

* The mortality for the years 1915–20 relates to civilians only.

Before we write off all this rise as a product of more accurate diagnosis and certification of causes of death, or as due to the steady prolongation of lives into the ages most prone to die of cancer, we must remember the causes which all through this long period have been doing their best, and potently, to produce a fall—vastly improved surgery, anæsthetics, asepsis, new pathology, better medical education, research, and devoted medical work at every stage. Cancer patients have shared with others the benefits of the great developments in the voluntary hospitals, in the poor-law medical service, and in other methods of caring for the sick, which during this time have changed almost beyond recognition. Nevertheless, if all these things have stemmed the tide, the flow continues. It is small wonder, therefore, that in these later and post-war years, when so much attention is being given to the prevention of disease and the reduction of sickness, a desire has arisen in many quarters to see what may be called normal medical effort strengthened by special collective action.

Special Collective Action.

Until lately only a few examples of such special collective action came readily to mind, although they were important ones. There was in particular the foundation of three special cancer hospitals. The primary object of these hospitals, the Cancer Charity of the Middlesex Hospital, founded 1792 (now the Middlesex Cancer Hospital), the Cancer Hospital, established 1851, and the Christie Hospital, Manchester, established 1892, was doubtless that of providing institutional treatment for incurable cases, but each of them has widened its scope, and now treats patients in all stages of the disease, and possesses a modern research department. Then there was the Imperial Cancer Research Laboratory which began with the Cancer Research Fund, now the Imperial Cancer Research Fund, established through private munificence in London in 1902 (under the patronage of H.M. the King) and placed under the direction of the Royal Colleges of Physicians and Surgeons, whose work is known to you all. I should mention also the Radium Institutes in London (1911) and Manchester (1915) which, though also undertaking the treatment of other conditions, are mainly concerned with neoplasia. All the special institutions just mentioned owe their foundation, and in some cases their daily maintenance, to private generosity; they are in no sense State or municipal organisations.

Among the studies of cancer made for the State during the period are, of course, the well-known reports from the Registrar-General's Department, in which the mortality from cancer as a whole and its specified varieties, as judged from certification of causes of death, has been regularly collected and reviewed, annually and decennially, and all the work directly or indirectly bearing on cancer which has depended on the Medical Research Council, and is equally well known to you.

Among instances of State intervention for the control of cancer was the action taken in November, 1919, when by an Order of the Secretary of State for Home Affairs (under Section 73 of the Factory and Workshops Act, 1901), epitheliomatous ulceration due to tar, pitch, bitumen, mineral oil, or any compound, product, or residue of these substances contracted in a factory or workshop was scheduled as a disease the notification of which was obligatory on medical practitioners. In one sense the action was merely part of the normal procedure adopted in the prevention of a disease liable to be caused by occupation, but its value, for a wider purpose, should not be ignored. Lessons learnt in the investigation of cancer caused by occupational risks may have an important bearing upon the elucidation of the nature of cancer in general.

Another step of importance was the handing over to the Medical Research Council, after the war, of a considerable stock of radium in the possession of the Government. This stock has been distributed to selected hospitals and used largely for treatment of cancer, always under the condition that its use is part of research and that the results should be reported to and considered by the Council, with the aid of its Radiology Committee.

Four Recent Directions of Activity.

I come now to certain forms of public action which are of more recent date.

(1) About the end of 1922 the Minister of Health decided to appoint a Departmental Committee "to consider available information with regard to the

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* Opening a discussion on the subject at the International Cancer Conference on July 20th.

causation, prevalence, and treatment of cancer, and to advise as to the best method of utilising the resources of the Ministry for the study and investigations of these problems." The chairman of the committee is the Chief Medical Officer of the Ministry, and its members include members of the medical profession with expert knowlegde of the disease in its various aspects—experimental, pathological, surgical, medical, statistical, &c.

(2) Following some interesting discussions on the comparative incidence of cancer mortality at the Office International d'Hygiène Publique (October, 1922), the League of Nations Health Committee decided, in 1923, to set up a Cancer Commission, the work of which, so far as the participation of England and Wales is concerned, has since been carried out in close association with the Departmental Committee.

(3) In 1923, also, the British Empire Cancer Campaign was started—a voluntary organisation with its centre in London, the object of which is "to correlate and extend all existing efforts in fighting cancer." The direction of the campaign is in the hands of a body of distinguished men, both lay and medical, and its principal activity, besides the coördinating work, is that of collection and disbursement of funds for promoting research into the causes and cure of cancer.

(4) During the last four or five years some of the larger municipalities have given considerable attention to the subject of cancer, especially those cities which are centres of medical education or well supplied with hospitals. The Departmental Committee above referred to has secured some coördination of this local work by forming a subcommittee, consisting of medical officers of health of the areas in question, which meets from time to time at the Ministry of Health.

(1) DEPARTMENTAL COMMITTEE OF THE MINISTRY OF HEALTH.

I hope to be forgiven for dwelling at disproportionate length on the work done at the Ministry of Health under the guidance of the Departmental Committee, merely because it happens to be well known to me. The standing problem which we then have before us is whether available skill and existing knowledge are, at the present time and with present weapons, being given all the chance to reduce mortality or relieve suffering that they ought to have. For example, does the obstacle lie in the absence of sufficient public propaganda in favour of early diagnosis and treatment, or in the faults of misdirected propaganda, badly conceived and based on half truths? If so, what is good, safe, and effective propaganda? Are cancer patients now presenting themselves for advice, but failing to get it? Is there doubt whether surgery or radiology do produce the results so often claimed for them, and how far is that doubt justified by the facts? Is the main difficulty one of getting sufficient facilities for early surgical or radiological treatment; are there, in fact, long waiting-lists of patients; and what should be done about it? Do we know enough of the conditions of incurable and inoperable cases, and are they alleviated as much as they could be? Finally, is there anything useful to be said as regards the way in which conditions which lead to cancer can be avoided? What do we really know about such conditions; are they as a practical matter avoidable; and if so, in what way?

Now the information needed to resolve these questions is not of the type which can usually be obtained by cancer research workers, whether in laboratories or the wards of hospitals. It demands the laborious collection and scientific statistical analysis of massed data regarding the conditions associated with the onset of cancer, the effects of various methods of treatment, and many other investigations for which it is almost essential that the resources of the central health authority should be added to those of other investigators. Work in these directions, moreover, requires that national experience as a whole should be checked and compared at different stages with that of particular local areas on the one hand and with that of different countries on the other. The Departmental Committee has endeavoured to secure both by the liaison systems I have mentioned, through its Medical Officer of Health Subcommittee, and through its representation on the League of Nations Cancer Commission respectively.

Data for Cancer of the Breast and Surgical Results.

The work alluded to has so far been chiefly concerned with the disease at the three sites—breast, uterus, and rectum. In the case of cancer of the breast a statistical analysis undertaken of published literature and of the clinical records of hospitals established on a broad basis the fact that operative treatment (by which is to be understood the complete operation) results in the survival for long periods—ten years—of as many as 80–90 per cent. of patients if they submit to operation at an early stage of the disease—i.e., before it has spread beyond the confines of the breast. Once the disease has spread beyond the breast the chance of prolonged survival diminishes rapidly. In both categories the analysis made did more than confirm an opinion long held by surgeons; it brought the facts into terms capable of precise expression and established a firm basis on which the medical profession and the public are safe in acting. There is, moreover, no escape from the practical conclusion; without any extension or alteration of existing facilities for diagnosis or treatment a very large number of the lives now lost from this cause could be saved if a larger proportion of patients were submitted to operation in an early stage of the disease. Using data which permitted lessons to be drawn from average figures, it was found that an average interval of some nine months is allowed to elapse between the patient noticing the abnormal condition and seeking treatment. While it is not possible to state an average period necessary for spread of the disease to the axillary glands, in a large proportion of patients these glands are affected within six or seven months of the onset, as observed by the patient.

It is not too much to say that this demonstration that early operation affects such an overwhelming proportion of cures (for absence of recurrence after ten years can usually be regarded as a cure) surprised many surgeons. The figures seemed too good as an index of the average results obtained by surgeons in general. But the conclusions of the Committee have been strengthened by a later analysis of a still larger sample of English hospital cases in a report not yet published. In this later analysis the results after operation were also correlated with the microscopical characters of the growth. Though there was evidence that the glandular and colloid varieties had a higher survival rate than the spheroidal-celled growths there was no evidence in the latter that the more cellular growths had a worse prognosis. It was also found, contrary to the general impression, that risks of recurrence are not appreciably greater in younger than in older patients. In all cases the most important factor in prolonged survival is the stage of the disease at which appropriate treatment is applied. And in all cases the hopeful method, at present, of reducing mortality is to find some means of inducing women with an abnormal condition of the breast to seek treatment as soon as any abnormality manifests itself.

The analysis has also enabled the factors which have been thought to be of importance as predisposing causes to be sorted out and their influence statistically assessed—*e.g.*, infertility, injury, chronic mastitis, and transient non-suppurative mastitis—matters in which it has now proved that the experience of certain foreign countries is closely parallel to that of England.

"Natural Duration."

The Committee at an early stage found that they needed another piece of knowledge—namely, the average interval between the onset of the disease, as observed by the patient, and the fatal termination in those cases where for one reason or another no attempt at radical treatment had been made—i.e., an average figure representing the so-called "natural duration" of the disease.

Earlier observations had shown that "natural duration" varied considerably with the organ affected. It had long been recognised that, especially in the breast, the course of the untreated disease might be extremely protracted, occasionally to 20 years or more, and it was also known that some cases ran an unusually rapid course. But the large series of observations collected for the Committee have enabled a useful series of average "natural durations" to be estimated on a large numerical basis. For some of the commonest accessible sites they are as follows:—

Breast..	38 months.	Tongue and mouth	16 months.
Uterus..	20 "	Larynx..	14 "
Rectum	26 "	Œsophagus	12 "

Data for Cancer of the Uterus; Alternatives to Surgical Treatment.

Turning now to the site next investigated—the uterus—it may be said briefly that much the same principal deduction from the public health standpoint emerged—viz., that the earlier the disease was surgically treated the better was the result. Moreover, similar conditions prevailed in respect of delay in seeking treatment, the average interval in this case being somewhat shorter than in the case of the breast. This presumably is to be correlated with the shorter natural duration.

But for cancer of the cervix uteri an entirely different factor came into the field of investigation—viz., the alternative method of treatment by radiology—necessitating a comparison of its results with those of surgery. Broadly it appeared that in operable cases the percentage of survivals to five years might be approximately the same for both kinds of treatment—viz., 40. Additionally, of those patients who were beyond the reach of surgery some 10–12 per cent. were freed of their disease for the same period by radiological methods. When it is remembered further that these results of radiology are obtained at practically no immediate risk of death and that in more advanced cases still, where eradication of the disease seems out of the question, considerable alleviation of symptoms can be secured, it becomes clear that at this site we have a method of treatment equal if not superior to surgery.

From the public health standpoint another aspect should be mentioned. It seems probable that, with wider use of a method of treatment less repugnant to most women than operation, one of the probable reasons for delay in seeking treatment may be eliminated and opportunities for securing a larger proportion of survivals improved.

If this attitude towards the treatment of cancer of the cervix is broadly true it gives a different orientation to the subject and brings it much more closely into the sphere of "public action." One has only to consider the cost and special nature of radium, the complexity and delicacy of deep X ray apparatus, and the specialised skill needed for its application. A greater degree of organised centralisation for radiological treatment becomes inevitable if radiological treatment is to effect the great benefit and life saving which it can apparently produce.

Data for Cancer of the Rectum.

With the aid of the Departmental Committee the Ministry of Health has also undertaken an investigation of the literature relating to the surgical treatment of rectal cancer. This proved more difficult and in some ways less conclusive than those into cancer of the breast. The operative treatment was more recent and less standardised, a greater number of variable factors to be taken into consideration, while in this case there is greater difficulty of diagnosis and greater inaccessibility of the growth. Though the operative mortality was high (about 16 per cent.) the proportion of survivals to three years amounted to nearly 40 per cent. Here also the average delay between the onset of symptoms and seeking treatment was serious, extending to 13 months—an important reason for the rarity with which these cases could be regarded as operable.

Relationship of Cancer to Dietary.

A subject which has given rise to much theorising is the possible relationship of dietary to cancer. The line of thought commonly followed is that as native races, whose diet is more "natural" than that of white races, suffer from cancer to a less degree than others, the two events are probably correlated. Whether it is true that native races are less affected is really not yet known; much has been said on the subject, but the data needed for judgment do not exist. But supposing it to be the case, it does not follow that the native immunity is to be explained by the existence of a causal relationship between diet and cancer. The Departmental Committee in this connexion was fortunate enough to have a good opportunity for inquiring whether cancer mortality was low in members of religious orders subjected to certain dietetic restrictions. A somewhat detailed investigation failed to adduce evidence in support of the contention.

Reports and Further Programme.

The technical reports in which the foregoing deductions were drawn have been issued among the series of Ministry of Health reports on Public Health and Medical Subjects, published by H.M. Stationery Office.[1] In addition they have been made the basis of non-technical memoranda[2] issued by the Ministry of Health for the information of local health authorities and the general public.

This kind of work at the Ministry of Health is continuing—it is extending to radium treatment, cancer of the skin and lip, and other matters. It is an attempt at thorough stock-taking of the position in one section after another, intended to be useful not only to the Government departments and to local health authorities, but to practising physicians and surgeons and to the public. It will also be of value, I hope, for reference in future years; we would give much to be able to assess our progress by reference to similar comprehensive studies if they had been made, say, 30 years ago.

(2) CANCER COMMISSION OF THE LEAGUE OF NATIONS.

For appreciation of the inquiries into cancer which the Health Committee of the League of Nations decided to regard as appropriate to its functions, I may commend to your notice the summarising report (C.H. 631, 1927) made recently by the Cancer Commission, which covers the work done, with the aid of its statistical subcommittee and other experts, from 1923–27. They originated in an attempt to account for the remarkable differences in mortality at two sites, the breast and uterus, as shown in the national statistics of three countries, England and Wales, the Netherlands, and Italy. For example, the death-rate for cancer of the breast in the Netherlands is little over one-half of that shown by the English figures, and the rate in Italy is about one-half that of the Netherlands. As regards the uterus, the rates for Italy and the Netherlands are approximately the same, being somewhat higher in the former; but both are considerably lower than the English rate. Such differences are frequently to be found in different parts of the same country, but in this case the national contrasts were strong and their investigation seemed promising. Prolonged and exhaustive inquiries from the statistical, clinical, and other aspects were made into a whole series of factors which might be thought to have produced these effects. Many plausible and conjectural explanations were taken up, but one by one were shown to be of no validity. But while the explanation of these national differences remains still hidden, and the Commission concluded that it is useless to seek further for it, the investigations which were put in hand led to useful results in other directions. A particularly interesting by-product was an anthropological distribution of races in Europe, worked out by Pittard and Niceforo, with which known facts as to cancer mortality were correlated. Much work similar to that of the English Departmental Committee was undertaken by national groups of experts, not only in Holland and Italy, but also in other countries. This settled various questions on the basis of the experience of several countries; for example, it determined the statistical relations between fertility and cancer of the breast; it confirmed the dictum that the essential point in the relation of cancer of the uterus to parturition is the fact of parturition and not the number of pregnancies, while in regard to the success of early operations the foreign statistics were closely parallel to that obtained by the English group. The Commission insisted on practical lessons derivable from its inquiries, notably as to the need for greater resort to surgery or radiology at appropriate stages, the importance of attention to obstetric methods to prevent the occurrence of chronic inflammation of the cervix, and the advantages of greater national and local expert coöperation for research into cancer problems. They considered also that their inquiries had shown that there is urgent need, in all countries possessing an organised official service of statistics of causes of death, to determine more exactly the degree to which certification by causes is unsatisfactory and how its scientific value may be improved. In the case of cancer such inquiries should take account of the need for uniformly attributing cancer deaths to the primary site of occurrence.

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[1] P. H. and M. S.: No. 28, Cancer of the Breast and its Surgical Treatment, 2*s*. 6*d*. No. 32, A Further Report on Cancer of the Breast, with Special Reference to its Associated Antecedent Conditions, 3*s*. No. 33, A Report on the Natural Duration of Cancer, 9*d*. No. 34, Report on the Late Results of Operation for Cancer of the Breast (Leeds), 6*d*. No. 36, Diet and Cancer, with Special Reference to the Incidence of Cancer upon Members of Certain Religious Orders, 9*d*. No. 40, Cancer of the Uterus: A Statistical Inquiry into the Results of Treatment, being an Analysis of the Existing Literature, 3*s*. 6*d*. No. 46, Report on Cancer of the Rectum, 1*s*. 6*d*. No. 47, Report on the Treatment of Cancer of the Uterus at the Samaritan Free Hospital, 9*d*. No. 51, Report on the Late Results of Operation for Cancer of the Breast (eight County Boroughs, England and Wales) (in press).

[2] No. 426, Memorandum on Cancer. No. 476, On the Effects of Radium and X Rays Upon Normal and Cancerous Tissues. No. 496, On Cancer of the Breast, the Results of Treatment by Operation. No. 516, Memorandum on Experimental Cancer Research. No. 716, Memorandum on Cancer of the Breast. No. 826, Memorandum on Cancer of the Uterus. All obtainable (1*d*. each) from H.M. Stationery Office, Kingsway.

Following this report, the Health Committee at Geneva laid down, last May, certain other lines of inquiry for its Cancer Commission, which seemed to require the kind of expert liaison which the League is in position to supply. Among these are the different incidence of cancer associated with the same occupation in different countries, and the results of radiological treatment of cancer. A subcommission of expert radiologists and gynæcologists under the presidency of Prof. Regaud began its work last month on the *latter subject*.

(3) THE BRITISH EMPIRE CANCER CAMPAIGN.

Imbued with the necessity of increasing the volume of investigation devoted to the various means for controlling the disease, a body of public-spirited men undertook to form an organisation whose main object was, by financial assistance, to coördinate research, extend existing research centres, and to stimulate the formation of new ones. The funds subscribed to the headquarters of the Campaign in London are allocated to individuals or centres who desire to carry out investigations into any aspect of the cancer problem which is considered likely to be of value, whether direct or indirect. The annual reports of the Campaign set out the allocations made and the purposes to which they were put.

Apart from the central organisation, provincial ones have been initiated, among which may be mentioned the Yorkshire Council, which has collected a large sum of money and set up an active research centre in association with the University of Leeds. Similarly, another organisation, to embrace Lancashire, Cheshire, and North Wales, seems likely to succeed in extending the existing facilities for research in the University centres of Liverpool and Manchester. Somewhat similar efforts, varying with local circumstances and conditions, have been set up in other county areas and university towns.

Another type of action taken by the Campaign is the publication of the *Cancer Review*, a journal devoted to improving the means by which English readers may become more readily acquainted with the work proceeding elsewhere both at home and abroad. There can be no doubt of the value which this journal already possesses for those interested in any of the scientific aspects of cancer research.

(4) MUNICIPAL WORK.

Under this head it is well to draw attention to what is done in several important provincial centres to utilise the public health department, working through the medical officer of health, as a centre for the local study of the disease and for other practical effort in various directions. The work of several health departments, particularly those whose medical officers of health are included in the special subcommittee which meets at the Ministry of Health, has been invaluable to the inquiries which have been required for its Departmental Committee. Much of the information which has been needed in regard to the conditions associated with cancer, and those which require "follow-up" work, has been obtained by the medical or trained health visitor staff of these provincial centres. The local data have been valuable too for essentially local purposes; the health department has obtained present-day standards by which to measure progress in later years, while the local inquiries have brought out deficiencies which can be rectified in the matter of hospital and home treatment, and have permitted useful experiment. Thus in one or two centres trial is being made of special centres or clinics for women to facilitate early diagnosis of cancer of the breast and uterus. At others different methods of propaganda and educative action are adopted for the same purpose—lectures, talks, leaflets, and the like. The principle to be followed throughout all this local work is to secure the closest possible common action between the municipal health department and the authorities of the general and poor-law hospitals, the university if there is one, the voluntary agencies which support social work, and especially the staffs of hospitals and the medical practitioners—e.g., through the local branch of the British Medical Association—as well as the local work of the British Empire Cancer Campaign, where it is in operation. It is no part of the programme that municipal direction should be made prominent; it is enough for the health department if it can help. Where the medical officer of health is wanted to take the initiative he will do so, otherwise he is content to be one of many cogs on a useful working wheel. Personally I may express the opinion that cancer research has much to gain through his instrumentality, and the experience we already have is my justification.

In reviewing this brief outline of public action in England, and its recent developments, one is conscious of its patchwork, incompleteness, and even its inconsistencies and overlaps. Compared with some extensive efforts in the United States of which I have read, with the *centres anticancereux* throughout France, or with a State cancer institution such as is represented by the new Institut Victor Emmanuel III. in Milan, it may seem meagre. But at least it has in it the elements of elasticity and capacity for development on almost every side, whether in pathology, causation, diagnosis, or treatment, as occasion requires.

VICTORIA HOSPITAL FOR SICK CHILDREN, HULL.—Last week the Right. Hon. T. R. Ferens opened a new ward and named it "The G. F. Grant Ward," in compliment to the treasurer, who has been associated with the institution for 40 years. The two rooms which compose the new ward will be used for ophthalmic, and nose, ear and throat cases respectively.

CHEMOTHERAPY IN MALIGNANT DISEASE,

WITH SPECIAL REFERENCE TO LEAD.*

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IN the few minutes at my disposal in which to open this discussion, I can do little more than briefly outline the scientific basis, the scope, and what may be the future developments of so-called "chemotherapy," especially lead-therapy, in the treatment of malignant neoplasia. First, however, it is necessary to decide what is meant by the word "chemotherapy." "Chemotherapy" probably dates from that remote period in the history of mankind when the treatment of disease was first recognised as being possible. But, as a science, "chemotherapy" came into existence in the last half of the nineteenth century following the bacteriological discoveries of Pasteur and the synthetic enterprises of Ehrlich. It is, however, somewhat unfortunate that the word "chemotherapy," which has a very general meaning, should have been adopted for use in the somewhat restricted sense in which it is usually employed to-day.

Definition of the Word "Chemotherapy."

"Chemotherapy" is defined in Dorland's Medical Dictionary as "Treatment based on the selective affinity which various chemicals have for the tissues of the body and for the organisms that may infect it." Kolmer[1] states that "The term chemotherapy is difficult to define in a brief and concise manner," and he calls attention to the chemotherapeutical affinity shown by drugs like strychnine, digitalis, morphine, cinchona and the rest. It seems, therefore, that we are in need either of a less general term to describe the chemical methods applied to the treatment of parasitic and neoplastic diseases, or of a limitation of its meaning. "Chemotherapy" has become so incorporated in our medical vocabulary that limitation of its application would probably be the better procedure, and I would suggest the following definition. *Chemotherapy denotes treatment by synthetic preparations which have a selective therapeutical action on abnormal tissues of the body and on the organisms that may infect it, with or without the production of associated constitutional phenomena.*

Chemotherapy Applied to Malignant Disease.

Selective chemical treatment in respect of malignant neoplasia may be based on a belief in some supposed causal factor, such as a parasite. Doubtless in these circumstances the therapeutist would seek to develop along the recognised lines the known synthetic parasiticides, none of which is unispecific—that is, specific for one organism only.

Those of us who do not favour the idea of the existence of a specific parasite in connexion with cancer, but believe rather that malignant neoplasia is a specific growth-process (dedifferentiation)—a process that is initiated by many predisposing factors—will turn first to the quest of the mysterious agent or agents that normally control differentiation and somatic correlation. I have not time, nor would it be pertinent to a discussion on chemotherapy, as defined, to dwell on the many observations that have been made in respect of these phenomena, especially by means of experiments in vitro.

Failing to discover the biological—that is, natural biochemical—regulators of differentiation, we must seek some chemical substance that will arrest growth as such, and endeavour to discover one that has also an inhibitory action on the essential functions of the cancer cell, or a selective affinity for some part of its chemical constitution, and some influence on its physicochemical state. In order to produce its effect it should be possible for the chemotherapeutical agent to be injected into the blood stream, and it must reach the cancer cells. Further, in accordance with the principles of chemotherapy, the preparation should have as high a chemotherapeutic index as possible.

If our chemotherapeutical methods are successful we shall expect to find: (*a*) destruction of the neoplastic cells—necrosis; or (*b*) arrest of the growth: (1) without complete disappearance, (2) with gradual disappearance; and we might add a third event, although it is improbable—namely, the redifferentiation of malignant into normal somatic tissue.

If the growth be of large size and undergo rapid necrosis, it is hardly possible that the normal tissues of the host will deal with the necrosed tissue without surgical aid; but when the neoplastic cells are seriously damaged and their devitalisation is gradual, the normal tissue reactions may be such as to lead to the removal of the dead or dying cells. This, apparently, is what happens in successful treatment by X rays and radium.

Lead-therapy in Malignant Disease.

In order to make clear the rationale of the treatment of malignant disease with lead, I must digress first to explain our views on the nature of malignant disease, and, secondly, to illustrate the properties of lead that are concerned in the chemotherapeutic action that may occur.

I have spoken of the specific growth-process of dedifferentiation. It is impossible here to discuss the views that have been advanced on this subject. It is, however, a process that hardly admits of dispute at the present time. The essential point, so far as our own views are concerned, is that this reversionary process is directed towards the trophoblastic type, perhaps through, rather than to, that of the embryonic somatic anlage. Hence the adult somatic cell that undergoes dedifferentiation passes back through the later stages of somatic development before reaching the primitive type. Consequently malignant neoplasms vary considerably in the degree of dedifferentiation that they have undergone, and the most malignant tumours are those in which dedifferentiation is greatest.

In very malignant tumours we should, therefore, expect to find syncytium, as indeed we do. Furthermore, it may reasonably be held, as I have previously suggested, that those forms of so-called "chorion-epithelioma" that are unrelated to pregnancy, for example, "chorion-epithelioma" of the testis, represent merely a high degree of dedifferentiation, and, therefore, of malignancy. A large part of our work has, then, been directed to the demonstration of the chemicoconstitutional and functional—and not only to the morphological—resemblances between the chorionic epithelium and malignant cells of somatic origin.

Now, it seems that every chemotherapeutical agent employed in malignant neoplastic disease should have two attributes at least: (1) the power to arrest cell-growth generally; (2) a special affinity for malignant cells and the chorionic epithelium.

It has long been known that lead arrests growth generally and causes abortion in the human subject. We have repeatedly shown experimentally that the growth of plants and animals is very definitely checked by this substance. We have also demonstrated that lead in suitable doses causes coagulation necrosis of the chorionic epithelium and that abortion is the result of this, rather than a sequel to intrauterine hæmorrhage of toxic causation. The chemotherapeutical index of this effect by a pure lead colloid is approximately 2—a very low ratio. Moreover, we and others have obtained experimental and clinical evidence that lead may cause a similar necrosis of cancer cells in favourable circumstances, but again the chemotherapeutical index is very low.

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* Opening a discussion on the subject at the International Cancer Conference on July 19th.

[1] Kolmer, J. A.: The Principles and Practice of Chemotherapy, with special reference to the Specific and General Treatment of Syphilis, 1928.

Lead in Tumours.

We have found that after treatment lead may be recovered from malignant neoplasms in considerable quantity. In two human cases the lead-content of the malignant tumour definitely exceeded that of the neighbouring normal tissue.

In the case of a carcinoma of the liver, secondary to carcinoma mammæ, the tumour held 41 parts per million of lead, and the adjacent hepatic tissue 11 parts per million. This is an important observation, for lead is always present in large quantity in the liver after the intravenous administration of this metal.

In the other case, a periosteal sarcoma, the tumour contained 12 parts per million of lead, whereas the normal bone in the neighbourhood contained 1 part per million.

Waterman, likewise, has made interesting observations in regard to the lead-content of the primary tumour and pulmonary metastases in chicken sarcoma. His finding that the pulmonary metastases contained more lead than the primary growth may, perhaps, be explained on the ground of the vascularity of the lungs. Waterman has also shown that tumours treated with lead in vivo are not so readily transplantable as untreated neoplasms.

The Mechanism of the Action of Lead.

Although much work has been done by my colleagues, Prof. W. C. McC. Lewis and his associates, with a view to discovering in what way lead acts on normal growing tissues and on malignant cells, no very definite conclusions have, as yet, been reached; but it appears possible that the action in regard to cancer is both local and constitutional. In respect of the latter some observations on the restoration by lead of the lipase co-enzymic activity in the serum of cancer patients have recently been published by these members of the staff of the Liverpool Medical Research Organisation. It may be remarked, however, that the local effects are likely in the long run to be of much greater significance than the constitutional.

The position at present, then, is that lead inhibits growth and affects the cancer cell deleteriously. Whether this selective action is associated with growth processes only, or in addition, as we think probable, with some special function or constitution of the cancer cell, remains to be finally proved; the question has, however, an important bearing on the chemotherapeutical aspect of the subject.

Apart from this there is another matter that has exercised our minds, and it is this. Since, from whatsoever angle we regard dedifferentiation, we must come to the conclusion that cancer cells resemble in many ways morphologically and functionally the cells from which they are derived; and it follows that the less dedifferentiated the cells are the more they will resemble those from which they arise. For illustration we may mention cancer of the thyroid and cancer of the liver.

It seems, therefore, that in the synthetic preparation of any chemotherapeutical substance, such as a lead-complex, we should take into account not only the specific action of the remedial agent in regard to growth and the malignant cell generally, but also, so far as our knowledge permits, we must consider the special chemical constitution, function, or evokable reactions of the differentiated (specialised) tissue in which the malignant neoplasm has developed. For example, it may be suggested that a sulphur-lead complex should be specially useful in cancer of the skin. One can envisage that the ideal combination would be one in which the affinity of the lead for the sulphur was such that the combination would only be broken by the cancer cell, without previous alteration of the lead-complex.

This method is, of course, simply a way of making the poison more acceptable to the cancer cell, and of enabling it to reach its objective, and so produce the maximum effect.

If it were found possible to make on these lines a preparation of lead which was absolutely specific for any one well-defined type of malignant growth, it would appear that the lead preparation used should vary according to the original tissue from which the neoplasm has sprung.

The Present Position of Lead-therapy.

On such an occasion as this, and in the presence of so many distinguished investigators in the difficult field of cancer research, all of whom know that patience is required in the final solution of this problem, I have felt it wise to confine my remarks meticulously to the title assigned to the discussion and to the time allotted to me.

I have said enough to show that even though we have reached the stage of believing that lead is detrimental to the cancer cell, just as arsenic was long known to be to the spirochæte, we have still far to go; consequently, an analysis of our clinical results, however interesting, would be informative only in respect of the beneficial effects observed, and I have on several previous occasions adduced evidence on this point.

If there is to be discussion of the continually changing position in respect of clinical treatment, I would indicate, if I may be permitted to do so, the lines along which such discussion may, perhaps, most profitably proceed: (1) the preparation of lead employed; (2) the methods of administration: (3) the effects on cancer of the administration of lead followed by exposure to radium; (4) the same followed by exposure to X rays; (5) the effects on cancer of operation, including diathermy, followed by (or preceded and followed by) the administration of lead; (6) the effects on cancer of the administration of lead alone; (7) the effects of lead on other hyperplastic and neoplastic diseases, such as lymphatic leukæmia and lymphadenoma.

I anticipate that the consensus of opinion will bear out the statement I made in the first paper published on this subject (1922) that the effects of radiations are augmented by the previous use of lead. Also, the employment of lead as a prophylactic measure against recurrence after surgical operations for cancer, will, I think, be held to be of great value. Last, but not least, there is a considerable body of evidence supporting the view that by itself lead, even in the crude preparations now used, can cause the disappearance and apparent cure of malignant neoplasms in favourable circumstances, and sometimes can beneficially affect leukæmia and other neoplastic conditions.

Evidence that may be adduced to controvert these statements must be analysed in regard to the modes of procedure practised, and the nature of the cases to which the treatment was applied.

In conclusion, I would repeat that which I have attempted to indicate in my remarks, namely, that the problem of successful chemotherapy in malignant disease, on the basis of the definition I have submitted, is one of extraordinary complexity, but that it is one which is worthy of careful investigation and exploitation.

NORFOLK AND NORWICH HOSPITAL.—After holding for 37 years the post of honorary physician to the Norfolk and Norwich Hospital, Dr. F. W. Burton-Fanning has resigned. In their resolution of appreciation of his services the Governors congratulate him on researches which have increased the sum of general medical knowledge and enhanced the reputation of the hospital.

WAKEFIELD CLAYTON HOSPITAL.—Last week Mr. G. C. Childs, of Camden, New Jersey, a Wakefield man, who has made a fortune in America, opened a new out-patients' wing which he has provided at a cost of £30,000. The accommodation includes departments for the ear, eye, and throat, massage, ultra-violet rays, dental surgery, medical and surgical consulting rooms, casualty rooms, an operating theatre, and a dispensary. Mr. Childs has promised, in addition, to provide a new ward.

TWO CASES OF "CONTRACTION RING."

WITH OBSERVATIONS ON TREATMENT, ESPECIALLY BY AMYL NITRITE.

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THE first account of a case of "contraction ring" is by Smellie,[1] who in 1743 visited in a workhouse a woman who had been in labour five days and "neglected by the surgeon and midwife of the house." He found that the head was low in the pelvis and tried to deliver her with forceps, "but," he adds, "was surprised that I did not succeed when I found the head was not large, the instrument so easily introduced and firmly fixed." He performed craniotomy, and fastened a hook in the skull, but could not, with all his strength, bring it along. After removing the skull bones he "found the under part of the uterus strongly girt or contracted round the neck of the fœtus." "This I gradually dilated, bringing down one of the arms, and pulling on that and the shattered bones and scalp with both my hands, I at last extracted the child with greater ease than I expected. . . . In pushing up my hand to dilate, my fingers passed the mouth of the womb that was girt round the middle of the head, when I was surprised to find another contraction before the shoulders." The puerperium in this case was prolonged.

The next case is that of Baltzell,[2] who describes early rupture of the membranes and a long labour in an extremely fat and corpulent primigravida. After several attempts at delivery the final treatment adopted was "abstraction of blood by copious venesection to relax the system and to embrace the moment of its immediate effect to extract the fœtus with the forceps." This also failed, and the patient expired after 70 hours. Four hours after death a post-mortem examination was made, and it was found that "near the neck and shoulders of the child, the uterus had the appearance as if a circular band about half an inch wide had been forcibly drawn round it."

In 1870[3] Gay described a case of obstructed labour in which the bony pelvis was normal, and with some difficulty he managed to get his hand above a ring of contraction in the uterine wall. Here his hand was "trapped," and, being unable to withdraw it, he proceeded to make a more complete study of the condition, which was typical of what we now know as "contraction ring." In 1882 Smith[4] published the "first work on the question" (Chéron). This consists of a weighing of the evidence for and against Bandl's hypothesis of the formation of a new cervix in the later months of pregnancy from the lower segment of the uterus, upper part of the vagina, and cervix uteri. This idea had already been sharply criticised four years previously by McDonald[6] of Edinburgh, who maintained that Bandl's ring was "conspicuous only by its absence." Smith's own contribution to the matter was a collection of 30 cases of "hour-glass contraction," from which he excludes all "doubtful cases, such as rigid os." He makes no mention nor distinction of the condition now known as "tonic contraction." In 33 labours of 30 women, 8 mothers and 25 children were lost. Three women died undelivered, and, as only seven of the women were primiparous, the remainder had presumably had previous successful pregnancies; this would largely exclude from his series tonic contraction due to mechanical obstruction. He points out that the most general symptom present in these cases is early discharge of liquor amnii. Seven children were saved by turning, and one child by forceps. "The craniotomy record is sickening"—ten cases. He discusses the possibility of Cæsarean section, but finally sums up against it.

Chéron's exhaustive treatise of 1899[7] describes 59 cases; the author had personal knowledge of 18. He makes no distinction between "hour-glass contraction" and the retraction of obstructed labour. In fact, he makes the following statement: "La rétraction isolée de l'anneau de Bandl est un phénomène qui n'est point démontré par les faits cliniques; il est toujours accompagné par la rétraction du corps utérin." Of the cases described, many are clearly associated with pelvic contraction, and his summary of the causes of the condition shows confusion between the two main types recognised at the present time. Among maternal causes he gives obstruction to the passage of the fœtus, early rupture of the membranes, prolonged labour, the premature use of ergot, and in particular the use of bags. Of fœtal causes he states that the most common are shoulder, incomplete breech, and face presentation. The paper is largely concerned with the comparative difficulty and danger of embryotomy and version.

Herman,[8] in 1902, doubted the existence of contraction ring.

Clifford White,[9] in 1913, drew a distinction between contraction ring and retraction ring. In reviewing the treatment to be adopted in contraction ring he first observes that expectant measures are useless, and quotes cases in which they had failed. He mentions the drugs in common use at the present time—i.e., chloroform and morphia—and also two cases successfully treated by amyl nitrite. None of these drugs does he regard as of material value. In his series of 90 cases he finds that where no laparotomy took place the maternal mortality was 58 per cent. and the fœtal mortality 63 per cent. In those in which laparotomy was performed the maternal mortality was 31·5 per cent. and the fœtal mortality 42 per cent. He mentions Willett's[10] method of continuous weight-traction, first employed in 1912, in which a weight of 8 lb., representing a pull of 6¼ lb., brought about delivery after three hours. Williamson, by gentle traction with forceps for 15 minutes, had similar success, marred only by incomplete rupture of the uterus. A third case of contraction ring causing obstruction to the delivery of the after-coming head and overcome by gentle traction was described at the same time.

Author's First Case.

CASE 1 was a primigravida of 27, due to be delivered on Nov. 6th, 1927. She had a bony frame of large proportions, and was grossly obese, so that accurate examination was impossible. Her medical history was stainless, beyond the fact that since puberty she had become extremely fat and heavy. She said that her weight was 17–18 stone. Labour pains began at 1 A.M. on Oct. 20th, and became slowly more severe and frequent up to 3 A.M. on Oct. 21st, the membranes having ruptured shortly before that hour. Her doctor was sent for, and, finding the os fully dilated, attempted to deliver her with forceps. In this he was unsuccessful, and, summoning further assistance, he examined her under chloroform, found that the occiput was posterior, and again failed to deliver her.

On admission to hospital her pains were moderate in severity, her temperature 98·4° F., pulse 96, and lacerations were present at the vulva. The uterus could barely be made out; the presentation could not be determined, and the fœtal heart could not be heard; this was not surprising in view of the thickness of the abdominal wall. Vaginal examination without an anæsthetic was impossible, owing partly to tenderness of the lacerations and partly to the fat surrounding the vulva. At 10.45 A.M. an anæsthetic was given, and examination showed that the os was fully dilated. The vertex was only moderately low and had not reached the pelvic floor. It lay well in the brim, and it seemed clear that the pelvis was causing no obstruction to the passage of the head. The occiput lay posteriorly. Attempts at rotation were fruitless, and no rotation could be achieved even when the vertex was with difficulty pushed just above the pelvic brim. The diagonal conjugate was 4 inches. It was not possible to get the hand above the head, but this was thought to be due to general mechanical difficulties of examination, and no further cause was sought. Finding no obstruction to the descent of the head, the forceps were applied, but soon abandoned when even strenuous efforts failed to cause any descent.

Examination by Dr. J. P. Hedley an hour later revealed a non-pulsating cord around the child's neck, and above this a rigid band of uterine muscle closely surrounding the neck. The lower border of this band lay just above the level of the pelvic brim. The skull was perforated, the bones of the vertex removed, and a cephalotribe fixed to the base ventricular node and bundle) is seen to form seven distinct connexions. These are: (*a*) Through its branch to the atrial septum with a posterior atrial vessel, a descending branch of the ramus ostii cavæ superioris, and anterior atrial branches from the right and left coronaries. (*b*) In the interventricular septum with branches from the right and left coronaries, and a branch arising from the right coronary near its origin. Of this last vessel, which occurs in 20 per cent. of my series, I can find no previous mention. Its importance, moreover, merits a fuller description. Leaving the under surface of the right coronary close to its origin, it runs downwards and backwards in the substance of the crista supraventricularis to reach the interventricular septum, where it anastomoses with the septal branches of the anterior descending division of the left coronary (Fig. 3) and, in some instances, with the ramus septi fibrosi. This artery was present in five hearts showing extensive disease of the proximal portion of the anterior descending branch of the left coronary. It may assist in supplying the right limb of the bundle.

Stress is laid on this anastomotic network supplying the neuromuscular tissue because of its importance in the interpretation of clinical findings. Injury to the conducting tissue (heart-block, bundle lesion) is shown on electrocardiographic tracings. Tracings in cases of coronary occlusion show these rarely; in some they are transient,[2] the ordinary blood-supply being apparently able to protect this important tissue. Géraudel[3] reports two cases of Stokes-Adams syndrome in which the ramus septi fibrosi (artery to the node and bundle) was stenosed. My present series includes a case in which partial occlusion of this vessel did not produce a lesion recognisable by the electrocardiograph. This heart showed a well-developed atrial branch of the ramus septi fibrosi communicating with the anastomotic network in the atrial septum.

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FIG. 3.

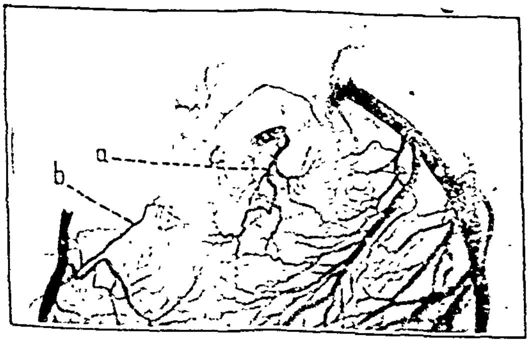

Diagram of upper portion of interventricular septum. (*a*) Artery present in 20 per cent. of cases (additional supply to right limb of A-V bundle). (*b*) Ramus septi fibrosi.

This article refers to the first 92 hearts in my series.

My best thanks are due to the honorary staff of the Royal Victoria Hospital for the material put at my disposal; and to Mr. Leman and Miss Baird, of the radiological department, for their technical assistance.

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SERUM PROPHYLAXIS IN MEASLES.

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IN recent years attention has been more and more directed to the study of measles, and while an advance has been made in the provision of increased hospital accommodation for the treatment of the disease, the preventive aspect has not received its due recognition. It is 12 years since Nicolle and Conseil, in France, and Park and Zingher, in America, first published the results of their work in this direction, and since then comparatively little additional literature has appeared on the subject. This paper is based on work at Monsall Hospital, Manchester, the opportunity for which was furnished by an epidemic of measles of considerable proportions in that city during the last few months of 1927.

It is well known that the serum of patients convalescent from measles can be used either to prevent or to attentuate the disease. At times when measles is epidemic it is inevitable that the wards of an infectious diseases hospital should become cross-infected, and any remedy for this state of affairs should be extremely valuable. As the epidemic period of measles is rather limited, it was all the more desirable to concentrate on the preventive use of serum, and accordingly no work was done on sero-attenuation of the disease.

For the provision of serum the choice of donors is necessarily limited largely by the age-period of the disease. This was one of the greatest difficulties, and full use had to be made of the few adult patients who were admitted. The donors who kindly provided blood for this work were mainly nurses from other institutions in the city who had the misfortune to contract measles. Two to three hundred cubic centimetres were removed when possible, the time chosen being from the seventh to the tenth day after deferrescence.

The procedure followed in the preparation of the serum was that of Debré and Joannon, the details being as follows:—

1. The blood after removal from the donor was allowed to coagulate at room temperature for 36 to 48 hours. 35 to 40 per cent. of serum was obtained.

2. A Wassermann reaction was performed with each sample of serum.

3. The serum was heated at 56° C. on two successive days.

4. The sterility of each sample of serum was tested by cultural methods.

brought down and the abdomen of the fœtus was now embraced by the ring so tightly that no further progress could be made. Conditions were unchanged for ten minutes, when an inhalation of 6 minims of amyl nitrite was given. For one minute no change could be felt in the consistency of the ring, but at the end of this time traction on the trunk caused easy descent of the fœtus and further examination of the ring was not practicable. Delivery was complete in three minutes. The placenta was retained in the uterus, and as the condition of the patient was poor as a result of antepartum hœmorrhage, the placenta was expressed by Crédé's method, without much difficulty. Hæmorrhage in the third stage was slight. The fœtus was about 1½ months premature, and stillborn. The head was not grossly misshapen. The puerperium was normal.

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STEREOSCOPIC RADIOGRAPHY OF THE CORONARY CIRCULATION.

BY JOHN S. CAMPBELL, M.B., B.CH. BELF.,
CLINICAL ASSISTANT TO THE PATHOLOGY DEPARTMENT, ROYAL VICTORIA HOSPITAL, BELFAST; PATHOLOGIST TO THE ULSTER VOLUNTEER FORCE HOSPITALS.

AT a meeting of the Association of Physicians of Great Britain and Ireland held in Belfast in June, 1927, I had the privilege of showing a series of radiograms in stereo of hearts and kidneys injected with an opaque emulsion. In answer to a large number of inquiries, I propose to give a brief account of the technique used and a few observations from a study of the injected hearts.

Technique.

Removal of Heart from the Body.—A portion of the great veins must be removed intact with the heart. This is essential if troublesome leakage from the atrial vessels is to be avoided.

Opaque Medium.—Röntyum, a preparation of barium, was found to give the best results. This substance forms a very fine and stable emulsion. Röntyum, 40 g., is emulsified with distilled water, 75 c.cm.

FIG. 1.

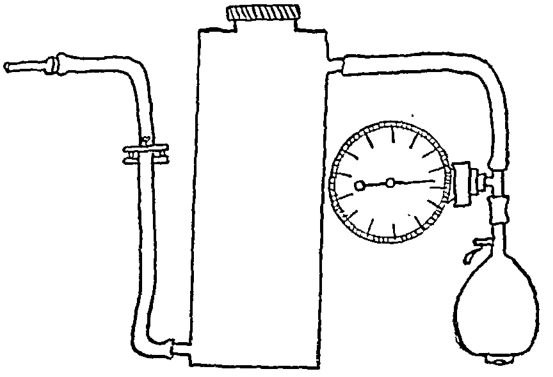


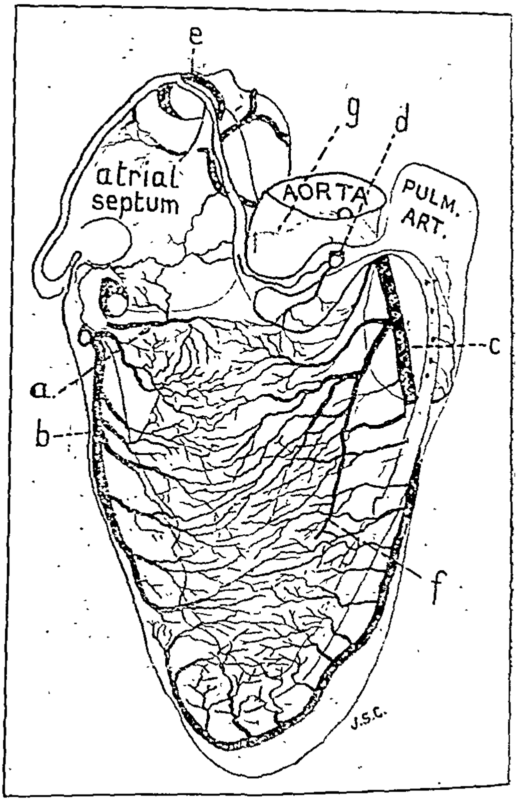
Diagram showing the apparatus.

Apparatus.—The diagram (Fig. 1) is self-explanatory. A pressure of 280 mm. of mercury is maintained for three minutes.

Fixation.—After injection of both coronary arteries the chambers of the heart are packed with wool and the organ immersed in 10 per cent. formalin for 24 hours to secure fixation in the best position for stereoscopic examination.

This simple method has been found to give satisfactory pictures when a stereoscopic X ray photograph has been taken of the injected specimen. The skiagrams demonstrate very clearly the finer ramifications of the cardiac vessels, while small variations in their calibre can be readily noted. A fuller interpretation of the skiagrams necessitates detailed knowledge of the minute anatomy of the cardiac circulation, for which I am indebted to the work of Gross.[1] The variations in the distribution of the coronary vessels as noted by him were confirmed, but their occurrence has been greater in my series. The alteration in the relative vascularity of the ventricles which comes with advancing age, and results in a decrease of the blood-supply to the right heart through an increase in the development of anastomotic branches, was also verified. Diminishing vascularity of the heart similar to that found in senility was found to accompany coronary disease.

FIG. 2.



Line drawing from stereophotograph of the cardiac septa (right aspect) showing a septal anastomosis and blood-supply of the A-V neuromuscular tissue. (*a*) Ramus septi fibrosi (*art. to A-V node and bundle*). (*b*) Right coronary, post. descending branch. (*c*) Left coronary, ant. descending branch. (*d*) Origin [illegible] ostii cavæ superioris. (*f*) Artery [illegible] nus limbi dextri). (*g*) Arteria [illegible] a. Kugel[4] describes this branch [illegible] ft coronary in 66 per cent. of his [illegible] er cent. in my series. Origin of [illegible] right coronary, post. circumflex [illegible] cent.); from the left coronary, [illegible] post. circumflex br. 17 per cent. (Gross—8 per cent.).

The Coronary Anastomotic Network.

Removal of portions of the ventricular walls made possible a stereoscopic study of the septal circulation and the supply of the neuromuscular tissue. Fig. 2 illustrates a rich anastomosis in the septum. In this case the ramus septi fibrosi (artery to the auriculo-ventricular node and bundle) is seen to form seven distinct connexions. These are: (*a*) Through its branch to the atrial septum with a posterior atrial vessel, a descending branch of the ramus ostii cavæ superioris, and anterior atrial branches from the right and left coronaries. (*b*) In the interventricular septum with branches from the right and left coronaries, and a branch arising from the right coronary near its origin. Of this last vessel, which occurs in 20 per cent. of my series, I can find no previous mention. Its importance, moreover, merits a fuller description. Leaving the under surface of the right coronary close to its origin, it runs downwards and backwards in the substance of the crista supraventricularis to reach the interventricular septum, where it anastomoses with the septal branches of the anterior descending division of the left coronary (Fig. 3) and, in some instances, with the ramus septi fibrosi. This artery was present in five hearts showing extensive disease of the proximal portion of the anterior descending branch of the left coronary. It may assist in supplying the right limb of the bundle.

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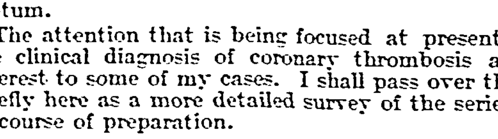

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It is well known that the serum of patients convalescent from measles can be used either to prevent or to attentuate the disease. At times when measles is epidemic it is inevitable that the wards of an infectious diseases hospital should become cross-infected, and any remedy for this state of affairs should be extremely valuable. As the epidemic period of measles is rather limited, it was all the more desirable to concentrate on the preventive use of serum, and accordingly no work was done on sero-attenuation of the disease.

For the provision of serum the choice of donors is necessarily limited largely by the age-period of the disease. This was one of the greatest difficulties, and full use had to be made of the few adult patients who were admitted. The donors who kindly provided blood for this work were mainly nurses from other institutions in the city who had the misfortune to contract measles. Two to three hundred cubic centimetres were removed when possible, the time chosen being from the seventh to the tenth day after deferrescence.

The procedure followed in the preparation of the serum was that of Debré and Joannon, the details being as follows:—

1. The blood after removal from the donor was allowed to coagulate at room temperature for 36 to 48 hours. 35 to 40 per cent. of serum was obtained.
2. A Wassermann reaction was performed with each sample of serum.
3. The serum was heated at 56° C. on two successive days.
4. The sterility of each sample of serum was tested by cultural methods.

5. Serum from at least three donors was pooled.
6. The mixed sera were tested by cultural methods.
7. The serum was stored in an ice-chest until required.

The serum was administered subcutaneously and a uniform dose of 10 c.cm. was employed irrespective of age and the length of exposure. No untoward effects were noted, nor were symptoms of serum sickness observed in any case. The details of the experimental work in chronological order are given below.

Experiment 1.—Measles broke out in a scarlet fever ward containing 14 children, six of whom were not recorded to have had measles, and of these, three were adjacent to the infective case, who was, of course, removed to an appropriate ward. The three nearest susceptible children were inoculated on the third day after exposure. Within six weeks the three uninoculated children developed measles along with three other children who were recorded to have had measles previously. The three inoculated children, aged 2, 4, and 4½ years, were under observation in the same ward for 62, 45, and 30 days respectively, and in spite of repeated exposure, failed to develop measles.

Experiment 2.—Three scarlet fever patients occupied a room with accommodation normally for one adult patient. None was stated to have had measles. One child developed the disease and was removed, and the youngest contact, aged 3 years, was inoculated on the third day after exposure and failed to develop measles during 28 days' observation. The remaining patient, aged 5 years, duly developed measles after the normal incubation period.

Experiment 3.—A baby, 2 months of age, was sent to hospital in error in an ambulance along with another infant suffering from measles. Infection was presumed to have taken place, and the baby was nursed in a measles ward, having been given serum on the third day of exposure. No symptoms were noted during observation for a period of 20 days.

Experiment 4.—Following the occurrence of a case of measles in a bed-isolation ward, three children, aged 3, 2, and 4 years, received prophylactic inoculations on the third day after exposure. Six days later another child developed measles, and after a further 11 days the sole remaining susceptible patient developed the disease. The inoculated children were under observation for periods of 51, 32, and 40 days respectively, and showed no symptoms.

Experiment 5.—An infant, 3 months old, in contact with measles at a children's hospital, received serum on the third day after exposure, and was nursed in a measles ward. No symptoms were noted over a period of 47 days.

Experiment 6.—Measles infection appeared in a diphtheria ward, and the only known susceptible children were two brothers, 5½ and 7 years of age. The youngest child only was inoculated on the third day and remained free from symptoms, while the brother developed a typical eruption on the fifteenth day after exposure.

Experiment 7.—Two children unrelated, notified as suffering from laryngeal diphtheria, were nursed in the same steam tent for 24 hours. Unfortunately, one proved to be in the prodromal stage of measles. The other, an infant of 6 months, was thereupon inoculated and failed to contract the disease during a month's observation.

Experiment 8.—A scarlet fever ward became cross-infected with measles. The five known susceptible patients, with ages varying from 2½ to 7 years, received serum on the second day after the occurrence of the case. It was hoped thereby to stamp out the infection. After the usual incubation period, a child stated to have had measles previously, contracted the disease, and, after a similar period, an adult, also stated to have suffered previously from the disease, developed typical symptoms. None of the inoculated children developed the disease.

Experiment 9.—Two days after exposure the only two children who were known to be susceptible in an infected diphtheria ward received prophylactic inoculations. Neither developed measles, and no further cases occurred in the ward.

Conclusions.

1. Measles convalescent serum is a safe and reliable prophylactic remedy, if given in adequate dosage within the first three days of the incubation period.

2. The use of convalescent serum is necessarily limited by the difficulty in obtaining suitable donors.

3. A history of an attack of measles in a child is frequently unreliable. This circumstance limits the absolute control of measles in a children's ward by the use of convalescent serum.

COMBINED VITAL AND NON-VITAL METHOD OF STAINING CORPUSCLES.

BY A. CECIL ALPORT, M.D. EDIN., M.R.C.P. LOND.

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THE following method of staining blood films is comparatively simple, and with a little experience can be carried out as a routine practice in all cases of anæmia. The original method of staining reticular cells was to take a drop of blood on a cresyl-blue stained slide, cover it with a cover slip and place it in a moist chamber in an incubator for 15 to 20 minutes; then a film was made by moving the cover slip over the slide, and finally it was counterstained with methylene-blue or Leishman's stain. This technique, however, is too complicated for general use. The method described below has the advantage not only of staining the reticular cells with cresyl-blue and the leucocytes with Leishman's stain on the same slide, but the technique is nearly as easy to carry out as staining a film with Leishman's stain only.

The method consists in :—

1. Staining a slide with brilliant cresyl-blue and making a blood film on this stained slide, or staining a drop of blood with cresyl-blue and making a film in the ordinary way.
2. Counterstaining the film with Leishman's stain.

(1) *Technique of Vital Staining.*—There are two ways of staining the reticulocytes: (*a*) Take a clean, grease-free glass slide, pass it through a flame nine or ten times so as to heat it well, and dip it into a glass jar containing a 0·3 per cent. solution of brilliant cresyl-blue in ethyl alcohol; then stand the slide on end for a couple of minutes to allow the stain to dry, and polish it gently on a piece of smooth paper or with a soft handkerchief. It is essential to heat the slide well as this ensures an even spread of the stain, without which the result is not, as a rule, satisfactory. On the cresyl-stained slide take a drop of the patient's blood and make a thin film in the usual way. Wipe off the stain on the reverse side of the slide with a damp cloth. The film can be kept or stained immediately with Leishman's stain.

(*b*) I find that a 0·3 per cent. solution of brilliant cresyl-blue in normal saline, to prevent hæmolysis, with 0·2 per cent. potassium oxalate added to stop clotting, is a quicker and more satisfactory method of staining the reticular cells. Take a large drop of blood on a slide and add to it about the same amount of cresyl-blue from a pipette; mix thoroughly by drawing this solution into the pipette three or four times. Place a drop of the mixture on the end of a clean fat-free slide and, holding another slide at an angle of about 50°, make a film in the usual way. This is necessary in order to obtain a thick enough film, as on account of the dilution of the blood if the upper slide is held too low down the film may be too thin to be satisfactory. The dilution of the blood also allows of an even spread, and the making of a good film becomes a comparatively easy matter.

(2) Cover the film with 12 drops of fresh undiluted Leishman's stain and allow it to stand for two minutes to fix. Add 12 drops of distilled water and stand for 7 to 30 minutes. Wash the film carefully until nearly all the blue colour has disappeared and dry rapidly with blotting-paper. To be successfully stained the film must have a faintly blue tinge in it. Overwashing tends to cause the disappearance of the blue from the granules of the reticulocytes, as brilliant cresyl-blue is very soluble in water; underwashing leaves too much blue in the leucocytes and spoils the effect of the Leishman's stain. The film is permanent and can be put away without necessarily mounting it under a cover-glass.

A film stained with Leishman's stain only, and showing marked polychromasia, will, when stained by the cresyl-blue Leishman method, show with few exceptions reticulocytes in place of the polychromatophilia. This probably indicates that the ordinary polychromasia is merely the ineffective staining of reticulocytes by Leishman's method.

SOUTH DEVON HOSPITAL.—Princess Mary on July 21st laid the foundation-stone of the new wing for extending the South and East Cornwall Hospital, and for providing accommodation for 60 additional patients and about 300 out-patients.

Reviews and Notices of Books.

HOW TO START IN GENERAL PRACTICE.

Being Practical Advice for the Newly Qualified. By ISAAC BRIGGS, M.R.C.S., L.R.C.P. London: John Murray. 1928. Pp. 158. 6s.

So long as a man's outlook in medical practice is not dominated by ideas of profit and loss, he will be all the better for some acquaintance with the principles that underly them. As the author of this excellent book says in the preface, the ethical side of practice is always being impressed upon the intending practitioner, often to the exclusion of business and practical considerations. If a young doctor takes up general practice with a limited capital and no business knowledge of how to use it, he is likely to have experiences that may sour his future outlook, and in any case, is at an unfair disadvantage compared with colleagues who have studied medical practice from a business point of view.

Remembering, then, that ethical considerations come first and will chiefly influence his future happiness, no intending practitioner can be the worse for a knowledge of what Dr. Briggs has to say. The book tells him how to register, which defence societies to join, and what to read, mentioning especially "The Conduct of Medical Practice," published by THE LANCET. He learns how to purchase a practice and is wisely told to guard against the temptation of dispensing with legal aid in doing so. "Amateur law or accountancy are far more expensive hobbies than amateur physic," says Dr. Briggs, and "if a vendor declines an accountant's investigation . . . bid him a courteous adieu." Advice is given as to courses open to those not possessing sufficient purchasing capital, and some useful notes about building societies, architects' fees, and contracts are added. Chapters follow on furnishing of a doctor's house and on renting rooms and garages. Another deals in great detail with methods of book-keeping.

The latter half of the book concerns itself with equipment, instruments, practice bags and, useful to those who intend dispensing, suggestions for stock drugs, lists of prescriptions, and other useful information culled from long experience in general practice.

It has been our melancholy experience to comment on certain American books, in which the authors have called loudly for permission for doctors to enter the field of business competition on equality with all men, to advertise their specialties to all the world, and generally to break through what they consider hampering obligations of old-fashioned and unbusiness-like methods. Dr. Briggs's book is based upon no such false position; nothing in it is in any way incompatible with medical practice as a vocation, and we commend it to those who have a high sense of the dignity of their profession but an unnecessary ignorance of business methods.

PRACTICAL SEROLOGY.

Third edition (1926). By LUIGI VIGANO, Professor in the Royal University of Milan; Assistant Director of the Serotherapeutic Institute at Milan. Translated by E. MARY HEFFER. Edited by C. G. L. WOLF, Addenbrooke's Hospital, Cambridge. W. Heffer and Sons, Ltd. 1928. Pp. 221. 12s. 6d.

THIS little book, which has run through three editions, in Italy covers a field not touched by any book of its size in English. In the course of just over 200 pages a large number of serological methods are described. The accounts are necessarily brief and partly, owing to translation, are not always quite clear. The chapter devoted to the care, nourishment, and breeding habits of laboratory animals contains much useful information. Workers in this country will be disappointed with the chapter on agglutination which gives no reference to G. Dreyer's (or any other) water-bath method for performing the test. The statement that inoculation agglutinins generally disappear from the body three or four months after the inoculation, and the suggestion that primary agglutinins can be easily distinguished from secondary ones by the height of the agglutinin titre will not meet with general agreement. The association of the Weil-Felix reaction with the diagnosis of cerebrospinal meningitis is an error; the test gives no help in this connexion. Four methods of performing the Wassermann reaction are set out; a method for obtaining quantitative results by keeping the amount of antigen and complement constant and using various dilutions of the patient's serum might have been included with advantage. No less than 18 methods are described for the diagnosis of syphilis by means of the flocculation reaction, but there is no guidance offered as to their respective values.

The book gives an interesting insight into the serological methods employed in Italy.

SEX PROBLEMS IN INDIA.

By Prof. N. S. PHADKE, Professor of Mental Philosophy, Rajaram College, Kolhapur. Bombay: D. B. Taraporevala, Sons and Co. 1927. Pp. 348. R.6.

THIS book is an exposition of eugenics in relation to the social conditions and customs of India. It is intended for Indian readers. The author writes with knowledge of his subject, which he is at pains to present, not as a new-fangled Western idea, but as one which, though emanating from the West, is supported in its essential points by numerous texts from Hindu Scripture. Thus Prof. Phadke's clear enunciation of the sociological and moral indications for eugenics in India is heavily supplemented by quotations from Sutras and Shastras, the relevance of which will be better understood by the Hindu than by the European reader. It is interesting to note that, while an advocate of Swaraj, Prof. Phadke holds that the achievement of self-government by Indians will not necessarily result in their immediate and automatic racial improvement. "To hope that a race of fit Indians will automatically arise the moment we are politically free is as ridiculous as to hope that a rich harvest will automatically be yielded when the rains come, even though we may sit with folded hands, taking no trouble of sowing."

Prof. Phadke's book is to be recommended to all Indians interested in the racial future of their country, and especially to the rising generation of Indian medical men.

FILTERABLE VIRUSES.

Edited by THOMAS M. RIVERS. London: Baillière, Tindall and Cox. 1928. Pp. 428. 34s.

THE recognition that many diseases may be due to agents which pass through bacteriological filters and are beyond the limits of ordinary microscopic vision has opened a fascinating field for research, as interesting as it is difficult. There is already a considerable literature on the subject, but it is scattered in various journals, and the treatment of virus diseases in the text-books is brief and uncritical. This volume, therefore, is a timely contribution to pathological literature. Published under the general editorship of Dr. Thomas M. Rivers, it consists of ten chapters, each dealing with a different aspect of the subject, and each written by a worker who is a recognised expert in his particular branch. The first chapter by the editor on some general aspects of filterable viruses is one of the best in the book. It is a sane and balanced presentation of the subject and is enriched by references to 539 articles. Other chapters deal with Filters and Filtration, by Dr. Stuart Mudd; Tissue Cultures in the Study of Viruses, by Dr. A. Carrel; Intracellular Pathology in Virus Diseases, by Dr. Edmund V. Cowdry; Virus Diseases of Man (Poliomyelitis), by Dr. Harold L. Amoss; Virus Diseases of Mammals (Foot and Mouth Disease and Vesicular Stomatitis), by Dr. Peter K. Olitsky; Virus Diseases of Fowls (Contagious Epithelioma), by Dr. Ernest Goodpasture; Virus Diseases of Insects (Sacbrood and Polyhedral Diseases) by Dr. Rudolf W. Glaser; Virus Diseases of Plants, by Dr. Louis D. Kunkel; and Virus Diseases of Bacteria (Bacteriophagy), by Dr. Jacques J.

Bronfenbrenner. Each chapter is accompanied by a bibliography, and there is an adequate index.

It will be noticed that only certain selected examples of virus diseases are discussed, others are mentioned in passing or are omitted altogether. This deliberate selection permits of a more general survey than would have been possible had a greater mass of detail been included in each section. The articles are not all of equal merit or equally judicial, but they are all well informed. Each author has had a free hand and if, therefore, points of disagreement are discovered in different chapters, this is merely an indication of the fluid state of our present knowledge of the subject. The volumes as a whole will be welcomed by all who are interested in virus diseases, and may be recommended as a reliable introduction to this important branch of pathology.

THE LOCOMOTIVE-GOD.

By WILLIAM ELLERY LEONARD. London: Chapman and Hall. 1927. Pp. 434. 18*s*.

Mr. Leonard, a professor in an American University, offers the world this autobiography of an agarophobe. After the onset of the symptom in adult life, he recovered a series of forgotten memories which, he reasonably believes, have a close relation to the phobia. This work of recovery, which occupied seven years, was carried on chiefly by crystal-gazing, and to the obvious objection that the memories were fantasies, he answers by detailed confirmation from outside sources. The "Locomotive-God" was a terrifying visualisation derived from frights in early childhood, and his description of the process of gradual resolution into its elements conforms to what is known of such phenomena and stamps the record as genuine. He wrongly applies the term psycho-analysis to his process of recall, whilst protesting frequently that Freudian elements are absent, but psycho-analysts will perhaps trace the evidence for these elements in such incidents as the compulsion upon his parents to sleep near him with the intervening doors open—a typical infantile situation which may call out for real analysis. The tyranny of the neurosis as it enforced itself upon relatives is adequately described, but unrecognised, by the author; the phobia led to their constant attendance, and in the tangle of cause and effect the regressive infantile need for their presence may well have been a stimulant of the phobia. Indeed, the psychopathologist will find in the story many situations the significance of which is lost to the writer, though this in no way detracts from the instructiveness of this human document. His phobia still persists, and its persistence will be regarded by some as proof that the genesis of the Locomotive-God is not fully revealed. The book has much value; what that value is depends upon the reader. The psychopathologist will doubtless find in it material to confirm his own special theories; the practitioner who tends to despise the neurotic will learn from it the suffering that the latter can undergo; the emotionally well balanced will gain insight into the emotions of the poorly balanced; but the poorly balanced themselves had better avoid it.

JOURNALS.

THE JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXXI., No. 3. July, 1928. Pp. 445–596.—The Fate of Colloidal Iron administered Intravenously, by C. J. Polson (Manchester). A combination of chemical and histological examinations shows that the iron accumulates chiefly in the lungs (where it forms emboli in the vessels) and in the liver and spleen (where it is ingested by endothelial cells).—Virus III., with special reference to the Response of Immunised Rabbits to Reinoculation, by C. H. Andrewes (London). The virus was found by making serial testicular inoculations. Partly immunised (sensitised) animals give a larger local response on reinoculation than either normal or immune animals. The virus survives longer in refractory animals such as the guinea-pig than in actively immunised rabbits.—Normoblast, Reticulocyte, Erythrocyte, by F. C. O. Valentine (London). The reticulum of reticulocytes originally forms the connexion between nucleus and cytoplasm.—The Gram-negative Cocci of the Nasopharynx, by S. P. Wilson (Manchester). Apart from the meningococcus and *M. catarrhalis*, a number of ill-defined forms can be distinguished, the systematic position of which is very dubious.—Cerebral Gliomata, by E. A. Carmichael (London). On the whole, the classification of Bailey and Cushing is substantiated; but it is too complicated and the author prefers a simple division into relatively malignant spongioblastic growths and relatively benign astroblastic tumours.—Continued Fever due to *B. alkalescens*, by J. Smith and A. N. Fraser (Aberdeen). The first recorded infection by this organism: a septicæmia arising after childbirth.—The Temperature of Normal Rabbits, by P. Lazarus-Barlow (London). A valuable series of four-hourly readings on eight rabbits for 23 days. The mean is 102·7° F., with a small but regular diurnal cycle. A deviation of 2°F is significant of something abnormal.—Multiple Zones in the Serum Precipitation Reaction, by N. E. Goldsworthy (Cambridge). Mixtures of horse-serum and the corresponding rabbit antiserum may show several foci of precipitation on either side of the optimal mixture which gives the largest reaction.—The Part Played by Alcohol in the Wassermann Reaction, by C. H. Browning and E. M. Dunlop (Glasgow).—Thrombo-angeitis Obliterans, by R. O. Girdwood (Aberdeen). A man of 29. The fibrosis which mats together arteries, veins, and nerves was a striking feature.—The Gastro-intestinal Flora in Pernicious Anæmia, by L. S. P. Davidson (Edinburgh). There is a great numerical increase in *B. coli*, streptococci, and *B. welchii*, both in the stomach and duodenum and in the fæces. No evidence was obtained that the varieties of these organisms present differed from these found in normal persons.—Tuberculosis in a Dog, due to Infection with a Bovine Virus, by G. S. Wilson and R. Lovell (London). A mesenteric gland in a puppy.—Gummata of the Aorta with Rupture into the Pericardium, by R. J. Wright-Smith (Melbourne).—Gumma of the Heart Wall in an Infant of Six Weeks, by J. W. S. Blacklock and J. A. W. McCluskie (Glasgow).—*Bacillus enteritidis* Infection in Wild Rats, by J. C. Kerrin (Aberdeen). Gaertner's bacillus was found in 11 of 100 wild rats in Aberdeen.—A Simple Apparatus for Filtering Small Amounts of Fluid, by D. L. Johnston (Aberdeen). A piece of Seitz filter is supported half way up a centrifuge tube.—The Cultivation of an Organism from the Spleen in a Case of Banti's Disease, by A. A. F. Peel (Glasgow). A pleomorphic fungus.

The LECTURES ON CANCER given as part of a post-graduate course held locally in the winter of 1926–27 have been published in book form by the Manchester Committee on Cancer. The volume includes also a special report on the results of operation in cases of cancer of the breast, compiled by Dr. John Murray and Dr. Gretta Wardle. The 14 lectures deal with general problems of incidence, causation, and treatment, and include detailed clinical studies of cancer affecting various organs of the body. The 521 investigation on operative results concerned 521 cases of cancer of the breast, of which 375 had been proved histologically to be malignant. They are divided into five classes, according to the stage of the disease at the time of operation. The most interesting records are those of the 183 patients operated on in the period 1910–13. In this group, 40 patients of all classes were alive 10 years after operation, while of the 29 patients placed in class one (early cases) 21 were alive 10 years after operation. It is interesting to r that one or two cases survived 12–15 years a operation and then died of a recurrent cancer. A s proportion of the cases still alive (7 per cent. of total number of living cases) have a recurrence.

This book of 150 pages is apparently issued but the insertion of a preliminary report from Scientific Research Subcommittee reminds reader the financial needs of the fund being raised for ca research in Lancashire, Cheshire, and North Wale

THE LANCET.

LONDON: SATURDAY, JULY 28, 1928.

CANCER: VIRUS OR ENZYME?

NE of the first sessions of the International Cancer ference, which concluded a week ago, was given -as was indeed proper and logical—to a discussion he ætiology of cancer. This discussion disclosed significant fact that wide differences of opinion erning the origin of malignancy still exist among e who have devoted a life-time to the study of the blem. If we revert to-day to this subject it is use two of the papers read by prominent path- ists in this country and the United States of erica appear somehow to have impressed the gination of the daily press, with the result that the lic has again been fed with sensational statements demands to know what it is all about. If we turn he official documents submitted by Prof. A. tch and Dr. J. B. Murphy to the conference— this is the only evidence which we can consider— nd little justification for this outburst in the press. eed, Dr. Murphy's paper is mainly concerned with discussion of a highly technical point—namely, ther the "agent" which produced the filterable ours of the fowl is a "virus" or an "enzyme." do not know what an "enzyme" is, we do not w what a "virus" is; they are little more than tract conceptions made to account for certain logical phenomena. We recognise their presence by results which they produce. The essential problem ented by the filterable tumour of the fowl is not ether the causative "agent" is a virus or an zyme, but its remarkable specificity of action, which ables it to reproduce exactly the same type of mour as that from which the "agent" was obtained. e bulk of Dr. Murphy's paper is concerned with idence which, in his opinion, demonstrates that the usative agent is an enzyme. This evidence consists having prepared from an active filtrate of a fowl umour by repeated precipitation a substance which, if injected, produces again the typical tumour. In the concluding paragraph of his paper Dr. Murphy states :—

> It is hardly conceivable that the active fraction which I have thus succeeded in obtaining, *a substance* purified by repeated precipitations, could carry with it through all these *manipulations* any living organisms or virus. To me the enzyme-like nature of the principle seems to have been conclusively established, but there may be some who would still *maintain* that, in spite of all, the possibility of a virus is not excluded. The final and crucial proof must be the production of the same substance from materials which certainly do not contain a virus. This has been accomplished. By similar technical procedures, I have isolated from such normal tissues as the testicles of normal fowls, not in contact with any tumour-bearing animals, a similar agent with which I have produced the typical tumour, transplantable in over 90 per cent. of fowls.

There Dr. Murphy's paper ends, and the reader is left breathless. It would indeed be a remarkable discovery it it were possible to extract *with a considerable degree of regularity* from the normal testes of normal fowl a chemical substance which, when injected into another normal fowl, would produce *with a considerable degree of regularity* a malignant new growth. It would not in itself solve the problem of malignancy, but would rather present us with a phenomenon of far-reaching significance in its general biological aspects. The perplexing thing is that an observer of Dr. Murphy's acuity of vision does not comment upon this aspect of his work, but is content to use this observation merely as an argument for the enzymic nature of the active tumour-producing principle—a matter of secondary importance. From the reports before us it seems, however, to be Prof. Leitch rather than Dr. Murphy who makes the wider claims for this observation. Prof. Leitch himself has reported that on one occasion he obtained a typical "Rous sarcoma" by the injection into a fowl of a normal fowl pancreas, but that on repetition in numerous experiments he has failed to obtained this result. He has also pointed out very truly that a positive result which can only be obtained once in a large number of negative experiments must necessarily be interpreted quite differently from a positive result which can be obtained with a considerable degree of regularity. A single positive result might conceivably be used as an argument against the virus nature of the agent, although it is perhaps not as conclusive sa Prof. Leitch and Dr. Murphy seem to think; but until we know the percentage of successes which result from the injection of the substance isolated by Dr. Murphy into a number of fowls, and the percentage of successes with which an active preparation can be obtained from the testis of a number of normal fowls, it is impossible to assess the *general* value of his observation. On these points Dr. Murphy is silent, presumably because he has not done a sufficient number of experiments to justify an expression of opinion.

A MEDICO-LEGAL INSTITUTE FOR LONDON.

London has no medico-legal institute, and it must be one of a few of the considerable towns in the world which is in that predicament. The *ninth* series of Methods and Problems of Medical Education, issued lately by the Rockefeller Foundation, gives illustrative descriptions of 24 such institutes, mostly in Europe, with accounts of their methods, together with several essays on germane topics and proposals for progress. They are for the most part substantial departments, generally attached to universities, with large buildings and staffed on much the same scale as a good department of anatomy or physiology. The two British establishments which are described (those at Edinburgh and Glasgow) are arranged on a more modest scale. A study of the whole volume cannot fail to raise the question, Why has London nothing of the kind?

The precise functions which a medico-legal institute discharges vary somewhat from place to place, but their main business is the study of violence, murder, and sudden death, and generally to deal with any pathological matters which arise in connexion with police work. The problems arising out of unexpected death are often very complex, and in some cases—e.g., murder—involve issues which are even more important than accurate death certification. Their study is a specialty, and like other specialties it demands a whole-time devotion if anything beyond a very ordinary standard is to be reached and if any fresh progress is to be made. The nearest doctor and pathologist, though well trained along ordinary lines, may well not be competent to elucidate all the delicate problems which legal medicine presents, and an institute staffed with experienced specialists to provide the necessary special training and knowledge. In London at the present time there is one morbid anatomist who has made himself a medico-legal expert, the bulk of medico-legal post-mortems are made by persons who may not be competent always to meet the difficult points, and there is no place where a man may get the necessary experience. What is needed so badly is a large establishment to which all the coroners' and police work will come—post-mortems, toxicology, sexual offences and the rest—and staffed with men who make it their life's work to study and know and practise the business which they have in hand. Whether it should be a university department attached to one of the larger medical schools, or in the Home Office, or under the chief medical officer of the L.C.C. is not now under discussion. The detection of crime is important enough, and the history of poisoning shows how deterrent has been the fact that the wits of those who find it out have been (as far as we know) generally a little better than the wits of those who do it. There may be a good deal of unsuspected poisoning going on, but as a rule those who meditate its practice seem to be afraid of being found out. An effective institute would promote this wholesome apprehension. But it is equally necessary that the causes of deaths which are unexpected and on the surface inexplicable should be made out as accurately as possible. The man who drops dead in the street is one of the most interesting and instructive objects for the morbid anatomist; he raises a special series of problems which are likely to be solved the sooner if he falls into the hands of those who have made a particular study of him. The frequency with which fibrous hearts are reported as fatty hearts by incompetent examiners illustrates the errors which, almost necessarily, follow the present haphazard arrangements.

Another point of importance has been emphasised by recent changes in coroners' practice. Our knowledge of morbid anatomy rests ultimately on our knowledge of normal anatomy. This we have few chances of studying and our knowledge is correspondingly meagre. Human life in western Europe is now long, and medicine is largely concerned with bodies which have passed their prime and may be degenerated. No one knows the extent of this degeneration, nor what would be found if one dissected carefully the first hundred apparently healthy persons met walking along a London street. Our only chances of getting this essential information are provided by deaths from violence, and it is as necessary that healthy bodies should be examined by the pathologists as that anatomists should have an adequate supply of material. Even with motor-cars and more than 5000 deaths per annum from road accidents, the experience of any one pathologist of violent deaths is very limited, and great advantages would accrue if they could be concentrated into a few specialised hands. Lately, to save expense, coroners have recalled the fact that their business is to find out the cause of death, and have failed to have post-mortem examinations made where that is obvious. In so doing they defeat their object more often than they may think; the real cause of death in a man pulped by a lorry may not be as obvious as it seems, and a surprising number of such fatalities show on dissection some substantial disease which is no doubt an important contributory reason why the accident has happened. But, this consideration apart, it should be frankly recognised that no opportunities of doing post-mortems on normal people should be neglected in the cause of medical science. An institute would do away with the difficulty about fees, and, one way and another, a medico-legal institute for London is a necessity which is long overdue. We are glad to see that the London County Council has promised to look into the matter and we hope its inquiry will be fruitful.

THE MENACE OF THE CLINIC.

THE medico-political issues of to-day give little opportunity for impassioned affirmations and ferocious gestures. The Representative Body of the British Medical Association, which considers these subjects for four whole days every summer, is denied the pleasures of oratory now by the conciliatory efforts of its advisers and now by the complicated nature of their proposals. But there are one or two subjects which still make the blood run faster through medical veins, and the assembly was quickened into liveliness last Saturday by picking up the scent of a possible menace to private practice. At first sight the quarry seemed unworthy of the chase, besides having the best intentions; but the meeting was unimpressed by its innocent and affable appearance, doubtless remembering that similar qualities could be claimed for the first rabbits which entered Australia. The fact that the ladies of Chelsea had politely sought the Association's advice about the best way to administer their clinic for middle-class babies or "paying centre for infant hygiene" in no way softened the hearts of those who, believing that the proper person to advise a middle-class baby about his bath, clothes, diet, and general upbringing was the practitioner who would attend him when he was ill, could not conceive the possibility that that practitioner might welcome in many circumstances a reinforcement in his task. Whilst everyone admitted that for poor people the infant welfare clinic was the best available source of information, it was felt that mothers who were prepared to pay five guineas a year for help with the rearing of their offspring would be much better advised to consult their own doctor—not only from his point of view, but from their own. The spokesman of the Council, Dr. J. W. BONE, said that it was no good trying to stop the setting-up of such clinics, and it would therefore be best to guide them along the best lines. He recommended, therefore, that the Association should define a policy that any further establishment of special paying centres should be for the purpose of education and not for treatment; and that mothers attending them should not do so without the knowledge of the family medical attendant. It may be mentioned that those responsible for the clinic, whose institution started the debate, have laid down exactly this injunction (see p. 210). Mr. BISHOP HARMAN, a member of the Council who supported these proposals, saw no objection to children attending such centres while they were in health. Dr. L. W. BATTEN ridiculed the idea of drawing a distinction between babies well enough to go to the clinic and those ill enough to see their doctor. Where, he asked, does hygiene end and treatment begin? Is regulation of diet a form of treatment, and, if not, how much weight must an infant lose before it is to be classified as sick and denied further advice at its clinic.

The steady constriction of the field of private practice is viewed by all with very natural alarm, and on Monday Dr. E. E. BRIERLEY and Dr. FORBES expressed a general opinion when they urged immediate consideration of the steps to be taken to stop the enclosure of more and more of this field by medical officers of health, by voluntary and rate-supported hospitals, and by clinics. But for the moment we wish chiefly to draw attention to the arguments, set out in the discussion, which bear on the value of clinics to the middle-class public, not forgetting either their menace or their value to busy practitioners. Dr. CHRISTINE MURRELL made a good point when she said that the clinic medical officer has the advantage of having at his hand all the facilities afforded by ancillary organisations, but here she must have been thinking of welfare centres for poor people who need the help of such organisations and not of women whose means allow them to subscribe five guineas a year for advice on the problems of infancy. Dr. E. R. FOTHERGILL insisted that the clinic must be comparatively ignorant of home conditions, but he also was thinking in terms of those whose environment may present the chief elements of risk to health, and not of those whose family circumstances are actually those of the medical officer. The pace of work may, however, prevent the latter from getting the information he ought to have, and, in the words of another speaker, the sight of 20 or 30 similar babies in an afternoon is harrowing to the clinical soul, and advice may tend to become stereotyped unless the adviser is doing a great deal of outside practice as well. The home, said Dr. FOTHERGILL, is where a mother or a child should be treated, and anything that takes her out of the home to consult a strange doctor cannot be in her true interests. But obviously this must depend on the quality of the assistance received from the family adviser, and also on the amount of time that he has at his disposal and on his personal attitude towards pædiatrics. Many practitioners are definitely averse from the task described by Mr. BISHOP HARMAN as sitting down day after day in the home and giving advice about the washing, feeding, clothing, entertainment, and education of infants. Some of them regard pædiatrics as the most important and interesting part of general practice, but others believe that everything of importance about infant feeding can be written on the back of a postcard. While Dr. BATTEN is right in saying that it is a low view of the family doctor to imagine that he only wants to tinker with the baby when he has become sick, the fact remains that those who are keen on the care of infants, and therefore fitted to advise upon them, need not in the long run fear competition. To some the word "clinic" has become a fetish and there is an impression that such places can offer something better than an individual medical man. This is a mistaken view; the fact that the clinic tends to send practice to specialists rather than to the family practitioner is a menace, but one which under the rules of the Chelsea Babies Club is ineffective, the coöperation of the practitioner being required in the future treatment. Dr. BONE said the last word in the matter when he pointed out that the public will certainly be the judges. The resolution reported on p. 195, whilst expressing comprehensible disapproval of paying centres for infant hygiene, will never be effective if the public believes that they fulfil a genuine want.

Mr. TURNER asked the meeting where the establishment of clinics was going to stop. If we had paying clinics for infants why not clinics for adolescents, fathers, mothers, old men, and maidens? He strenuously objected to the private practitioner being made a mere funnel through which patients were poured to some specialist destination; he did not want to be "the whetstone that renders the iron sharp, being itself absolved from the duty of cutting." We agree with him that the family doctor should and must be the principal agent in medical work in this country; but the public has a right to skilled advice and treatment, and it is becoming harder and harder to combine the balanced outlook of the general practitioner with a high grade of knowledge of the more special branches of practice. Dr. H. B. BRACKENBURY was able to tell the meeting on Monday that the General Medical Council is satisfied with the teaching of antenatal examination in our medical schools, but this does not mean that the newly qualified student can offer an opinion as good as that obtainable from an experienced obstetrician—whether at a clinic or elsewhere. Paying clinics will be popular as long as they provide advice that the public feel they have hitherto failed to obtain. But all clinics have inherent disadvantages, and they will cease to be any menace to the family doctor as soon as there are enough practitioners willing and able to undertake the kind of work they do.

Annotations.

"Ne quid nimis."

PAY-BED PATIENTS.

THE Report of the Special Committee, the Pay Beds Committee, of King Edward's Hospital Fund for London, was published last week, its wide reference being "to inquire and report upon the question of hospital accommodation in London for persons prepared to pay more than ordinary voluntary hospital patients." The Special Committee consisted of the following five persons, the late Lord Hambleden, Sir John Rose Bradford, Sir Bernard Mallet, Mr. V. Warren Low, and Prof. Winifred Cullis, but from the unanimous and valuable report, Lord Hambleden's signature is sadly missing.

The Report is largely founded on the replies received to a searching questionaire addressed to those hospitals which provide for pay-bed patients within the area of operations of the King's Fund—namely, that greater London which is included in a circle whose radius is 11 miles from St. Paul's Cathedral. The evidence thus obtained from 80 hospitals, general and special, is summarised in an appendix, from which it may be gathered that the sum of pay-beds in these institutions is 1055, of which rather more than half—namely, 522—are to be found in the special hospitals. The figures will, we think, be a surprise to many who have been unaware how far the pay-bed system had increased of late, but the analysis shows great diversity of practice. There is no uniformity about the fees paid, nor do the charges always cover the same services, nor are the arrangements, speaking generally, comparable; but it is perfectly clear that the demand of the public for these beds under one set of conditions or another is quite unsatisfied, and many witnesses testified to the Committee that a far larger provision of pay-beds is necessary as a valuable adjunct to all forms of practice. A classification of those who would be suitable for admission to pay-beds will be found in the Report, and all must recognise that the time when hospitals were only called upon to provide comparatively simple treatment for the necessitous poor is gone by. The Report says that "with the development of expensive methods of treatment in diagnosis a large number of the middle and professional classes are now unable to pay the full cost of services, some of which are often difficult to obtain outside hospitals." This is a moderate statement of a case which need not be set out at length in these columns, so often have we pointed to the fact that while the rich can buy

and the poor can be supplied with the best medical and (especially) surgical skill in times of emergency, the middle-class group of the community enjoys no such good fortune.

The general message of the Report is that a shortage of pay-beds exists and that it can be best met by a steady extension of existing hospitals or provision of separate hospitals, in both cases a scale of inclusive fees being arranged in proportion to the accommodation required. These recommendations, it will be seen, postulate the expiry of a good deal of time before the present situation can be met, though a mutual insurance scheme is suggested as a ready method of beginning the work. As might be expected from the origin of the special committee, the Report indicates where provision of pay-beds under proper administration can be turned into a source of legitimate revenue for the voluntary hospitals thus strengthening them in their charitable work.

SCIENTIFIC SOCIETIES AND INCOME-TAX.

SCIENTIFIC and professional societies, dependent for their financial existence upon the fluctuating subscriptions of their members or upon past savings, are keenly alive to the liability of their funds to income-tax. Not long ago the funds of the General Medical Council were refused exemption,[1] and now two recent revenue decisions, delivered upon the same lines, have again gone in favour of the Crown. It is high time that the many societies and bodies of this nature took counsel together and made some concerted effort to obtain protection for funds mainly devoted to professional education and scientific research. It is true that these funds are often in part concerned with the organisation of a profession and the qualifications and examination of its would-be members. But it is also true that the country, as a whole, obtains benefit from the creation and maintenance of high professional standards. There is probably no general desire that any funds relating to any form of education should be taxed; there was never a louder call than at this moment for the mobilisation of scientific knowledge in the interests of depressed industries; the yield, moreover, from the income-tax levied on professional and scientific associations must be comparatively trifling.

In order to escape liability for income-tax, a society must be "charitable" within the meaning of the Income-tax Acts and a certain statute of Elizabeth. Legally the advancement of learning is a charitable object, but legally there is no exemption unless the society's funds are devoted not only to charitable objects but to charitable objects only. In respect of the Geologists' Association (one of the two bodies upon whose liability Mr. Justice Rowlatt has lately passed judgment), the Commissioners said that the main function was the combination of members for scientific purposes and mutual improvement and the giving and receiving of instruction among themselves. Naturally these studies, pursued by the members in coöperation, tend to the increase of knowledge and indirectly to the promotion of education generally as well as other objects of public utility. But, while admitting this element of public benefit, the Commissioners nevertheless held that the Association was not a body established for charitable purposes only. They therefore disallowed the claim for exemption, and on appeal Mr. Justice Rowlatt has upheld them. He says they might have decided either way upon the facts, but he declines to say they had no material for deciding in the way they did. He interprets their decision as meaning that the Geologists' Association has for its main object merely instruction inter se: this object has a reaction upon the advancement of learning at large, but this element is not strong enough to take the Association out of the category of a purely private society of private individuals. The other recent case (the appeal of the Midland Counties Institution of Engineers), Mr. Justice Rowlatt thought even clearer. He quoted with approval Lord Watson's phrase in the Civil Engineers' case (decided some years ago), to the effect that exemption depends upon the intrinsic character of the object which a society promotes, and not upon the scope of the benefits which may result from its transactions. When one comes to consider, added Mr. Justice Rowlatt, the inevitable issue whether the purposes of a society are charitable and charitable only, the question which emerges is this: "Is there so much personal benefit to the members, intellectual or professional, as to be incapable of being disregarded?" It may be a substantial object of the society that its funds should benefit the members intellectually or professionally. This use of the funds will have the further object of benefiting the public by calling greater knowledge into existence. But, if the two objects are there, then the funds are not exclusively devoted to the one object. In both these recent cases the Commissioners, whose duty it is to find the facts, have held that both the two objects were present. As the like result may be expected in the case of all similar bodies, and as the refund of income-tax is now being withheld, it is not surprising that the subject is attracting attention in the daily press. Why, it is asked, should exemption from taxation be confined merely to philanthropic bodies? Why should there be no relief for the institutions which represent applied science? These institutions do not devote their funds to the personal enrichment of their members. They contribute to the development of national education, health, and industry. It is probably impossible for them to separate their funds and functions in such a way as to preserve from tax that side of their activities which is exclusively "charitable," while admitting liability in respect of those other activities which are concerned with the non-charitable element of benefit to members. The time has surely arrived for abandoning the dependence of our income-tax law upon the anachronistic definition of charities in the legislation of a queen who reigned happily in an age when income-tax was yet unknown. Parliament should be pressed to frame some fresh and simple provision for the relief of scientific education and research.

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CEREBRAL GLIOMATA.

IT has been a commonplace of pathological histology for many years that the series of tumours which arise from white fibrous connective tissue reproduce the various stages of development through which fibrocytes pass. At one end of the series is the round-celled sarcoma, in which the infant connective tissue cell persists permanently without undergoing any further differentiation; at the other end the fibroma, composed of the mature form. Two or three years ago Dr. P. Bailey and Prof. Harvey Cushing, of Harvard, pointed out that the group of tumours generally named "glioma" exhibit the same kind of series and between them produce all the embryonic phases through which the developing nervous system passes. They also pointed out that differences in structure were correlated with differences in clinical history; tumours which reproduce the adult or near adult stage differ from those of more embryonic structure in the same way, though not to the same degree, that fibromas differ from sarcomas. Morbid anatomy is generally pretty much the same all the world over, but it is interesting to have these ideas worked out on London tumours. This has been done by Dr. E. A. Carmichael working with 75 specimens accumulated at the National Hospital; his results are published in the current number of the *Journal of Pathology and Bacteriology*, a notice of which appears on p. 172. On the whole he fully confirms the results of Bailey and Cushing. At the same time, he points out that many tmuours are not composed wholly of one type of cell and that it may sometimes be almost impossible to assign a given tumour to any one of their types. It is, of course, equally true that many sarcomas are neither round-celled nor spindle-celled, but a mixture of the two, and to expect tumours of any kind to fall precisely into any series of pigeon-holes is to misconceive their nature and characteristics. The common tumours of the brain represent one stage or another of developing neuroglia, and Dr. Carmichael proposes that for practical purposes they should be divided into two main groups. The *spongioblastic* tumour is made up of a type of cell too embryonic to show any definite neuroglia fibrils; it is often degenerate and causes a reactionary gliosis in the surrounding normal tissue, and hence it is very obvious on naked-eye inspection; it occurs generally in people over 40, has a rapid clinical course, and causes focal signs before general pressure symptoms. The *astroblastic* tumour, on the other hand, is composed of a more adult type of cell with more or less developed fibrils; it is much less vascular, less prone to degeneration, causes no reactionary gliosis, and therefore looks very much like normal white matter and is quite ill-defined macroscopically; clinically, it occurs in rather younger people, has a longer course, usually causes pressure symptoms before focal signs, and is more amenable to surgery and radiation. For the present, at any rate, the refinements of cerebral tumours are for the specialists, but we seem to have here a plain advance in diagnosis and prognosis which should find its place in general medicine.

HOSPITAL COÖPERATION.

WHEN, as appears to be inevitable before long, the boards of guardians are abolished and their functions handed over to the county and town councils, the difficult problem of coöperation between the voluntary and the municipal hospitals, or poor-law infirmaries, will become urgent. Some form of coöperation there must be if waste and overlapping are to be prevented, and it is only reasonable to expect that the representatives of the voluntary institutions should be prepared with proposals likely to appeal to the practical common sense of the country. In Scotland the representatives of the voluntary hospitals have for some time past been in consultation on the subject, and have been asked by the Scottish secretary to form a committee and frame their suggestions. We have received a letter from

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The general message of the Report is that a shortage of pay-beds exists and that it can be best met by a steady extension of existing hospitals or provision of separate hospitals, in both cases a scale of inclusive fees being arranged in proportion to the accommodation required. These recommendations, it will be seen, postulate the expiry of a good deal of time before the present situation can be met, though a mutual insurance scheme is suggested as a ready method of beginning the work. As might be expected from the origin of the special committee, the Report indicates where provision of pay-beds under proper administration can be turned into a source of legitimate revenue for the voluntary hospitals thus strengthening them in their charitable work.

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SCIENTIFIC SOCIETIES AND INCOME-TAX.

SCIENTIFIC and professional societies, dependent for their financial existence upon the fluctuating subscriptions of their members or upon past savings, are keenly alive to the liability of their funds to income-tax. Not long ago the funds of the General Medical Council were refused exemption,[1] and now two recent revenue decisions, delivered upon the same lines, have again gone in favour of the Crown. It is high time that the many societies and bodies of this nature took counsel together and made some concerted effort to obtain protection for funds mainly devoted to professional education and scientific research. It is true that these funds are often in part concerned with the organisation of a profession and the qualifications and examination of its would-be members. But it is also true that the country, as a whole, obtains benefit from the creation and maintenance of high professional standards. There is probably no general desire that any funds relating to any form of education should be taxed; there was never a louder call than at this moment for the mobilisation of scientific knowledge in the interests of depressed industries; the yield, moreover, from the income-tax levied on professional and scientific associations must be comparatively trifling.

In order to escape liability for income-tax, a society must be "charitable" within the meaning of the Income-tax Acts and a certain statute of Elizabeth. Legally the advancement of learning is a charitable object, but legally there is no exemption unless the society's funds are devoted not only to charitable objects but to charitable objects only. In respect of the Geologists' Association (one of the two bodies upon whose liability Mr. Justice Rowlatt has lately passed judgment), the Commissioners said that the main function was the combination of members for scientific purposes and mutual improvement and the giving and receiving of instruction among themselves. Naturally these studies, pursued by the members in coöperation, tend to the increase of knowledge and indirectly to the promotion of education generally as well as other objects of public utility. But, while admitting this element of public benefit, the Commissioners nevertheless held that the Association was not a body established for charitable purposes only. They therefore disallowed the claim for exemption, and on appeal Mr. Justice Rowlatt has upheld them. He says they might have decided either way upon the facts, but he declines to say they had no material for deciding in the way they did. He interprets their decision as meaning that the Geologists' Association has for its main object merely instruction inter se: this object has a reaction upon the advancement of learning at large, but this element is not strong enough to take the Association out of the category of a purely private society of private individuals. The other recent case (the appeal of the Midland Counties Institution of Engineers), Mr. Justice Rowlatt thought even clearer. He quoted with approval Lord Watson's phrase in the Civil Engineers' case (decided some years ago), to the effect that exemption depends upon the intrinsic character of the object which a society promotes, and not upon the scope of the benefits which may result from its transactions. When one comes to consider, added Mr. Justice Rowlatt, the inevitable issue whether the purposes of a society are charitable and charitable only, the question which emerges is this: "Is there so much personal benefit to the members, intellectual or professional, as to be incapable of being disregarded?" It may be a substantial object of the society that its funds should benefit the members intellectually or professionally. This use of the funds will have the further object of benefiting the public by calling greater knowledge into existence. But, if the two objects are there, then the funds are not exclusively devoted to the one object. In both these recent cases the Commissioners, whose duty it is to find the facts, have held that both the two objects were present. As the like result may be expected in the case of all similar bodies, and as the refund of income-tax is now being withheld, it is not surprising that the subject is attracting attention in the daily press. Why, it is asked, should exemption from taxation be confined merely to philanthropic bodies? Why should there be no relief for the institutions which represent applied science? These institutions do not devote their funds to the personal enrichment of their members. They contribute to the development of national education, health, and industry. It is probably impossible for them to separate their funds and functions in such a way as to preserve from tax that side of their activities which is exclusively "charitable," while admitting liability in respect of those other activities which are concerned with the non-charitable element of benefit to members. The time has surely arrived for abandoning the dependence of our income-tax law upon the anachronistic definition of charities in the legislation of a queen who reigned happily in an age when income-tax was yet unknown. Parliament should be pressed to frame some fresh and simple provision for the relief of scientific education and research.

VARIATIONS IN THE IODINE AND THYROXIN CONTENT OF THE THYROID GLAND.

IT has been shown by many investigators that the physiological effects produced by desiccated thyroid can be brought about by the injection of pure crystalline thyroxin. The relation of the activity of the thyroid to the iodine compounds which occur in the gland is not, however, yet clear. A study of the effect of the seasonal variations and the influence of geographic distribution on these iodine compounds has recently been undertaken by Prof. E. C. Kendall, of Rochester, Minnesota, who communicated his results at a meeting of the American Association of Physicians held at Washington last May. The importance of considering the iodine compounds other than thyroxin became apparent in the course of the investigation, for the purpose of which 100 lb. of fresh hog thyroid glands have been analysed during the first few days of each month for 20 months. Various samples of thyroid material from different parts of the United States and England have also been analysed. The seasonal variation in the total iodine, already observed by other workers, has been confirmed. In January and February 100 lb. of thyroid may contain 14 g. of iodine; in July and August as much as 40 g. This applies to glands removed from animals in the Middle West. The seasonal variation was not observed in the material obtained from England and Scotland. The amount of thyroxin in these glands has also been determined. The importance of considering those iodine-containing compounds which are not thyroxin is shown by the fact that in the summer, when the iodine is at the highest, the percentage of total iodine in the form of

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[1] THE LANCET, 1928, i., 715.

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THE EFFECT OF EMOTION ON BASAL METABOLISM.

An attempt to study the effects of emotion on basal metabolic rate, pulse-rate and blood pressure is recorded in a concerted study[1] by Dr. H. L. Segal, Dr. H. F. Binswanger, and Dr. S. Strouse of Chicago. The emotional stimulus chosen in all cases was the dread of impending operation and the patients studied were divided into three groups; the first consisted of ordinary operative cases, the second of patients with hyperthyroidism who had received preoperative iodine therapy, and the third of patients with hyperthyroidism who had only received iodine in insignificant amounts or had had none at all. These patients had been in hospital for varying lengths of time and their basal metabolic rates had been determined. A test was done on the morning before the day of operation, and another on the actual day, and observations of the pulse-rate, blood pressure, and emotional state were made at the same time. In the first group no constant relation was found to exist between these factors, and the rise in the metabolism on the morning of operation was negligible. Of the 12 patients in the second group, only five showed outward evidence of emotional disturbance and the increase of basal metabolism on the morning of operation was slight or nonexistent. In the third group, in order to make fair comparison with the other two, the patients were informed on a certain evening that operation would take place on the following morning, but when the morning basal metabolism test had been done operation did not take place. In this group all cases were found to have an increased metabolic rate on the morning of operation, the minimum increase being +12 per cent., and the average increase for the six cases in the group being +41 per cent. The authors consider that this increase is due to an increased production of epinephrin rather to an increased secretion of thyroxin, because the return of metabolism to normal after the fright stimulus had been removed was so rapid. A thyroxin reaction lasts days or even months. The reaction shown would be consistent with increased heat production due to epinephrin, for this is immediate and transient. The authors suggest a practical use for their observations, in that a rise in the basal metabolic rate on the morning of operation might indicate that an insufficient dose of iodine had been given.

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[1] Archives of Internal Medicine, June, 1928.

Lord Londonderry, the president; Sir Frederick Eley, the chairman of the Council; and Mr. R. Roy Wilson, M.P., the chairman of the Weekly Board of the Chelsea Hospital for Women, which has been issued to the press, both medical and lay, and in which they place before the London hospitals the importance of taking a similar course, on the ground that it might be of appreciable assistance to the Minister of Health, if these institutions became articulate. The advice is sound, and the sooner it is acted upon the better. It is highly desirable that the voluntary institutions should define their attitude and make their considered proposals without serious delay. The present Minister of Health is so well affected to them, and realises so clearly their value as part of the machinery of the national health, that he would undoubtedly welcome a clear and authoritative statement of what seems to them to be desirable and practicable in the way of utilising those poor-law hospitals which, although they every year become more efficient, are not invariably utilised to their full capacity. Two hospital services side by side are becoming something worse than an anomaly, and every effort ought now to be made to prevent the permanence of such a state of affairs, or the emergence of anything in the nature of a State service to the prejudice of a voluntary one.

The British Hospitals Association has here a great opportunity. It falls naturally to it to tap the opinions of the many distinguished experts who administer the London hospitals and perhaps to follow up that step by initiating a similar inquiry in the provinces. As the greatest hospital centre in Europe, the capital must needs come first, but outside its bounds there are many curative institutions, any one of which is individually almost, if not quite, as important as the biggest of the metropolitan hospitals. Such an inquiry as that suggested will not reveal unanimity, but there is little reason to doubt that it would provide the materials for a workable consensus. Advocates of the nationalisation or municipalisation of the entire hospital service know quite clearly what they want and are determined to press for it, notwithstanding its certain enormous cost and its very problematical advantages. They can best be met by a workmanlike scheme which will bring the rate-supported hospitals into friendly inter-relation with those which depend upon the voluntary support of the public. This should be easy under a scheme which would enable the former to be more completely utilised while stimulating the latter to systematise its finance. For constant and often passionate appeals lend much colour to the impression, so sedulously cultivated in some quarters, that the voluntary system is always standing precariously close to the abyss of bankruptcy. How far that impression is from the truth cannot be too clearly or too widely proclaimed.

HEREDITARY AURICULAR FISTULÆ.

SMALL congenital fistulæ opening on the pinna or in its immediate neighbourhood are not excessively rare, and seldom cause trouble to those whom they affect. They are usually referred either to incomplete fusion between the small tubercles which form the outer ear, not a very satisfactory hypothesis, or to a "branchiogenic" origin of an indefinite sort, an explanation which is definitely unsatisfactory—in fact, wrong. Even if the condition could be shown to be associated with some mal-development in the pharyngeal arches, the arches concerned do not correspond with the branchial arches of gill-bearing vertebrates; these are represented by the third and following arches in the higher embryos, whereas the first or, maybe, the second, are the only arches within whose regions the fistulæ in question can be put. If it is thought absolutely necessary that a piscine nomenclature should be used, the operculum could be dragged in less objectionably, for there is some reason for associating the pinna with the operculum, but none whatever for putting it among the gill-bearing structures. Prof. E. Starkenstein,[1] of Prague, has recently published a short account of specimens of this affection in his own family, of which he has the advantage of possessing records going back to the fourteenth century. The hereditary nature of the condition is clearly brought out in this unusual contribution, and is illustrated by two "trees" extending over three or four generations. Although the families are prolific enough, the numbers given are, of course, too small to permit of any valid conclusions bearing on the laws of heredity; but it can be seen that sex is of no deciding value, that every incidence is immediately preceded by incidence in one or both parents, and that the affection may be one-sided or bilateral. A photograph shows a left ear with a small opening on the front part of the down-turned anterior end of the helix, above the level of the crus helicis. About three-quarters of an inch in front of this and below it is a small swelling, marking thick secretion gathered in the blind end of the track, from which it can be squeezed. The situation described here does not appear to come into line with the normal development of the outer ear, but it is quite easy to imagine a slightly abnormal formation of the second and third auricular tubercles affording a foundation for it, and it would seem that the condition might be put into that very large class of malformations in which the developmental processes must have been on abnormal lines from their inception, and which cannot be harmonised with what occurs in normal formation. However this may be, Prof. Starkenstein offers to students of such matters a class of material which is rarely encountered, and which, in all probability, will well repay close study.

CARE OF THE HEALTH OF MERCHANT SEAMEN.

FOR many years we have been calling the attention of our readers to the health, accommodation, and sanitary conditions of the men of the mercantile marine, and have been able more than once to report the advances that have been made on their behalf; but we feel that improvements are not proceeding rapidly enough and that sanitation is not progressing as fast at sea as on shore. There are two great impulses to improve sanitation, and neither is at its strongest at sea. Insanitary environments are brought to notice by a rise in death-rates or by the absence of fall of death-rates as rapidly in some as in other areas or trades; and as regards housing the death-rates that arrest attention may be, and often are, those of women and children, more susceptible and more continuously exposed to the evil conditions than are their menfolk. Such impetus to improvement does not help seamen, for the Board of Trade no longer publishes death-rates for them, while they live their lives and do their work apart, with no numerous attending crowd of women and children to act, like the white mice in submarines, as sensitive indicators of disaster. Another impulse to improvement is public opinion, and seamen derive little or nothing here. Thus visitors to areas of back-to-back houses are at once shocked, and, loudly contrasting what they see with the amenities of their own districts, awake locally a spirit of reform. But the ships are at sea or in docks, and in these regions, far from ordinary observation, escape public criticism; indeed if this were not so, the accumulation of refuse on board ships in dock, of which port medical officers complain, could not go on being repeated, nor could the old hand-flushed latrines of merchant ships have so long persisted if those accustomed to modern "sanitation" had made frequent visitations. Large passenger ships give their crews small cause for complaint; the trouble is in the tramp and coasting ships with small crews and, let it be admitted, small space. Nor must we forget that all improvements must be at the expense of the owners, and do not as on land bring in increased rent. The owners no doubt vary largely in their sense of responsibility, but medical opinion is dead against the employment, as an argument for nothing being done, that the men have all they require.

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[1] Med. Klin., May 4th, p. 701.

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[1] Archives of Internal Medicine, June, 1928.

TRANSMISSION OF FILARIA PERSTANS.

THE tradition that a doctor in the tropics must be observant of the strange phenomena of lesser and unregarded living things which the chances of general practice may bring under his eyes was founded by Patrick Manson. His infectious zeal for inquiry enthused his Chinese hospital dressers, and with their eager help, he made those famous observations on the development of *Filaria bancrofti* in the mosquito which formed the inspiring beginning of the modern science of tropical medicine. The example set by Manson has been followed by disciples of every nation, who though busy, like him, with the press of daily clinical duties, have yet managed to add to our knowledge of parasitology. Dr. Dyce Sharp, in the Cameroon has, almost as if on holiday, carefully observed and engagingly described the domestic affairs of gorilla and family. Moreover, with the simplest of material equipment, he has made valuable additions to knowledge in Manson's own subject of filariasis.[1]

In 1890 Manson found two new filarial embryos in the blood of a negro in the London Hospital who was suffering from sleeping sickness, and named one of these *perstans*. In 1898 the adult *perstans* was found in the mesentery of a Guiana aborigine by Daniels. In 1904 Bastian set out that any metamorphosis which *perstans* might undergo did not require an intermediate host for the purpose. Nevertheless Low, and later Fülleborn, conducted experiments with various mosquitoes, and with flea, lice, and tick, with negative results; except that both noted some development in the mosquito. The systematists were also at work. The proper classification of the worm gave rise to some discussion, and was disposed of only in 1926, when Yorke and Maplestone pointed out that Diesing had differentiated the genus in 1861 under the name *Dipetalonema*. So *Dipetalonema perstans* it must be; but for convenience, however, it is still referred to as *Filaria perstans*. The parasite is found in tropical Africa, and also in British Guiana and in New Guinea. Its principal area coincides with the chief habitat of gorilla and chimpanzee, in both of which apes it has been found. The adult worms are found usually in the root of the mesentery or in the perirenal tissues. The embryos appear in the peripheral blood by day and night, with a tendency to relative day or night periodicity. No more can be said than that in most cases the infestation appears to be harmless.

This was the position when Dr. Sharp began his investigations. In the Mamfe district of the Cameroon the incidence of infection is at least 92 per cent. of the native population. Dr. Sharp found *perstans* to be comparatively rare in the European, who to-day invariably uses a mosquito net at night. He reasoned that the vector of *F. perstans* must have far less opportunity of attacking the European; and since day-biting flies and night-biting mosquitoes attack black and white races impartially when these are unprotected, it was probable that the mosquito net was not the sole barrier against infection, but that the vector must also object to light even at night; for in no other way would the white man be protected while playing cards at midnight—an occasion when mosquitoes may be very active. Dr. Sharp asked his native servant, Kofi, if he knew of a small fly which bit at night only and did not readily pass through a mosquito net, but which must be very common in that region. Kofi quickly produced a very small fly (*Culicoides austeni*), which later proved to be an efficient vector of *F. perstans*. His master discovered in Kofi "a natural fly expert who never forgot or forgave an insect that bit him." He could distinguish by sight various species of culicoides. He knew them well. They fed only at night, and then only in the dark, and their needle-like prick was quite unlike the bite of mosquito or sandfly. Kofi had had to keep fire or lamp alight in his room at night to avoid their bites—then he had made himself a calico tent instead, under which he slept. From this tent, however, Kofi produced next morning 18 of these small flies (*Culicoides austeni*), all full of his blood; the females only are blood-suckers. And so the experiments began. Dr. Sharp declares they were carried out largely by Kofi's enthusiastic and untiring help, his amazing powers of observation, and his first-class vision—a necessity for seeing and catching these minute flies. *Perstans* embryos were found in Kofi's blood, and also in that of the two other houseboys. All these and a fourth, Peter, joined willingly, as helpers and experimental material, in the game of this friendly excursion in natural philosophy conducted in a bungalow in the steamy heat of the Cameroon. Peter was chosen for principal reservoir of *perstans* larvæ, and ready bait and feed for the culicoides vamps. *C. austeni* was discovered to be a determined night-biter—but darkness was essential. A lamp, giving a quarter of a candle power in a 7 ft. long tent was sufficient to discourage her advent. Wind deterred her, rain did not; a full moon gave almost complete protection from her. Captive culicoides were induced to feed in the day time by making the room dark and offering them an arm. Dr. Sharp's white arm was refused, though a black arm was eagerly bitten. A very high degree of humidity was found to be essential to the well-being of the fly and the development of her ova. Dr. Sharp undertook the difficult task of examination and dissection of the culicoides (1·5 to 2 mm. in length) at intervals of time after their infected feeds. He found that in *C. austeni* the *perstans* larva undergoes, in eight days, an ordered development through short thick forms to one thinner form three times its original length. At this stage the larva has reached the fly's proboscis, and escapes thence by stretching and finally bursting the terminal membranous portion of the labrum. Seven per cent. of "wild" culicoides were found to be infected. There is, therefore, strong presumptive evidence that *C. austeni* is an efficient transmitter of *F. perstans* from man to man. Dr. Sharp's observations make it probable that *C. grahami* is also a natural vector of *perstans*. In the Mamfe division of the Cameroon the forest has given way to low orchard scrub or open grass land, and the streams are torrential and tend to dry up after the rains. It is probably the most heavily infected with filaria of any district in the world, though *F. bancrofti* is rare. Dr. Sharp has shown that apart from blood infection, infection of the skin itself with filarial larvæ is very frequent in the natives of all ages and both sexes. It was common to find natives under 16 years of age showing simultaneous infection with leprosy, yaws, *O. volvulus*, and *F. perstans*. The pathogenicity of the latter is not known, but in view of the notably low health condition of the population it is difficult to exclude this high degree of parasitism as an accessory factor of general unfitness.

A PARATYPHOID OUTBREAK.

THE clinical details of the outbreak of paratyphoid fever which occurred in certain districts of Hertfordshire in November, 1927, were recorded in THE LANCET of Feb. 25th last by Dr. Iris Ward, house surgeon at the West Herts General Hospital, to which 43 of the cases were admitted. The prompt steps taken to ascertain and remove the source of infection were successful in limiting the epidemic to 166 cases. In a report[1] to the Minister of Health published to-day Dr. W. Vernon Shaw, one of the medical officers to the Ministry, sets out the details of the story from Nov. 15th, when the Minister received unofficial intimation of the presence of an epidemic of enteric fever in the Hemel Hempstead and Watford districts, until Nov. 24th, by which time 133 patients were safely isolated in hospital, and their homes disinfected and cleaned. On Nov. 16th, the day after his first visit to the district, Dr. Shaw had already elucidated the mystery, and from this date onwards no further spread of infection occurred. The population of the actual area invaded is about 21.000. Bacteriological examination of the water, which is mainly supplied from public sources, yielded satisfactory results. Arrangements for excrement removal, sewage, and refuse disposal are for the most part on modern lines. In the ten years prior to this epidemic there has been little prevalence of enteric fever, either typhoid or paratyphoid, except for an outbreak limited to the inmates and attendants at one of the Metropolitan Asylums Board's Hospitals in Watford Rural District in 1926. During the last week of October, 1927, and the first week of November many cases of illness occurred. These were at first diagnosed as influenza, but on Nov. 11th notifications of enteric fever began to reach the medical officer of health for the districts concerned. In all 129 houses were invaded. In almost every case notified the Widal test gave positive results to paratyphosus B. and the same organism was identified in the urine and fæces of a number of patients. No deaths occurred. Inquiry showed that throughout the infected area the only factor common to the persons affected was milk delivered to them by a retailer whose premises were situated in the borough of Hemel Hempstead. Dr. Shaw visited all the farms on Nov. 15th and could only discover any recent case of illness at W. farm, where one child, K. X., was ill with "broncho-pneumonia." A specimen of blood taken from this child gave a positive Widal to paratyphosus B, and on Dr. Shaw's advice he was removed to hospital with her mother, Mrs. X., on Nov. 16th. The latter within a few days of admission developed a metastatic abscess of the left breast. Her fæces and that of the child were heavily infected with paratyphosus B, and a specimen of her blood reacted with this organism up to a high titre. Mrs. X. admitted having suffered from diarrhœa on or about Oct. 10th, and is regarded as the source of the epidemic. It emerged that from Oct. 23rd onwards she had not only been washing the milk utensils, cooling the milk, and occasionally even milking, but also nursing the sick child, and the potential infection of the milk was doubtless increased by her close contact with the excreta of the child. Pasteurisation of milk at the premises of the retailer was commenced as early as Nov. 12th and was followed by a rapid diminution of the number of fresh cases of paratyphoid fever: but, according to Dr. Shaw, too great reliance was placed on the pasteurisation, which was carried out in a rough-and-ready manner. In the course of the epidemic five roundsmen developed paratyphoid fever, and it is fortunate that none of them appears to have been responsible for personally disseminating infection in the course of delivering milk on his rounds. After the removal to hospital of Mrs. X. and her child on Nov. 16th, further stoppage of the milk from the farm did not appear to be necessary, since other members of the household were examined for infection with negative results: the fact that no further cases occurred justified this policy. Dr. Shaw acknowledges the assistance received from the county medical officers of health, the practitioners of the district, and the officials of the various sanitary authorities concerned.

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[1] *Filaria perstans*, its Development in *Culicoides austeni*. Filariasis in the Cameroon, with Special Reference to Skin Infection by Microfilariæ, Trans. Roy. Soc. Trop. Med. and Hyg., vol. xxi., No. 5, February, 1928.

[1] No. 53. 1928. H.M. Stationery Office. Pp. 16. 3d.

The chief lesson to be learnt from the epidemic is the need for immediate laborious investigation in such circumstances of any history of sickness occurring at a dairy farm. Previous to Nov. 16th the child's symptoms had been attributed to the respiratory system and the mother's own mild attack of diarrhœa. which must have been the first manifestation of the infection, was only recalled to memory after the most searching inquiry.

Dr. Ambrose Owen has been awarded the Sir Charles Hastings Prize of the British Medical Association.

Dr. E. K. le Fleming (Wimborne) and Dr. J. W. Bone (Luton) have been selected by the British Medical Association as their candidates for the two vacancies as Direct Representatives of the Medical Profession on the General Medical Council.

Special Articles.

INTERNATIONAL CONFERENCE ON CANCER.

JULY 16TH–20TH, 1928.

(Continued from p. 143.)

SURGERY AT THE CONFERENCE.

THE Surgical Section at the conference organised by the British Empire Cancer Campaign had before it two principal subjects for discussion; the first of these was the classification and treatment of bone sarcomata. The forms of sarcoma affecting bone are many and the need for a convenient classification is great. Several of the surgeons from the United States of America described and praised the classification which was devised by Dr. Codman, for the purpose of a Bone Sarcoma Registry; this registry is now under the care of the American College of Surgeons, and to it are sent particulars of cases of bone sarcoma from all parts of the United States. The reports, including the clinical course, the operations, and the microscopical findings, are carefully examined and the cases classified, so that in time there will be collected a large amount of knowledge of a rather rare condition, of which most surgeons see only a few cases. This excellent plan might well be followed in this country, as there is certainly a great need for more knowledge on this subject. At the present time the most diverse views are held as to the nature of some of these tumours; for instance, there was a wide difference of opinion as to the malignancy of the tumour generally known in this country as a myeloma, for more than one American surgeon described it as truly malignant, while several British surgeons declared that, though malignant forms do occur, yet as a rule it is benign, and may be treated successfully in almost all cases by local removal. One speaker objected strongly to the name myeloma, and held that it grew from the endosteum and from osteoblasts, and therefore he suggested that a more suitable name would be osteoblastoma. On this the opener of the discussion stated that he did not believe in the existence of an endosteum; he had never seen it, and the most careful examination had failed to find it. All, however, were agreed that, if an improvement in the results of the treatment of the more severe form of sarcoma of bone can be achieved, it will be only by a recognition of the existence of the disease at a very early stage, and this is only possible if attention be paid to any persistent pain in a bone. If such a pain should fail to respond to simple treatment, it is certain that a radiograph should be taken, and the presence of a bone sarcoma may be revealed. In an early case such as this it may be possible in one way or another to treat effectively the sarcoma, while it is still confined to its site of origin. It may be that experience will show that radiation is the most efficient method of treatment, but it is agreed by all that in the vast majority of cases the early recognition of the disease is essential.

The second subject was the early recognition and treatment of cancer of the stomach. Here also the general cry was: "Let us see these cases early and it will then be possible to find the disease in a condition in which we may be able to remove it completely and so to prevent any recurrence." The same demand for early recognition of malignant disease and thorough treatment has long been made in the case of the breast, and the excellent results obtained with mammary cancer can only be had in cancer of the stomach if the cases are seen early by the surgeon. This can only occur if it is recognised by all that persistent indigestion in a person over 40 years of age should be taken as a sign that something more than mere "indigestion" is present, and that a thorough examination should be made by the use of all the facilities provided by X rays and other diagnostic methods. The skilled interpreter of radiographs will be able to recognise at once, in most cases, whether a simple ulcer or a malignant growth is present. The statistics provided by several speakers showed how delay in the recognition of cancer of the stomach prevented in many cases any chance of the complete removal of the growth and the neighbouring lymphatic glands; in one series of cases, quoted by Prof. Wilkie, there were admitted into the Royal Infirmary of Edinburgh 675 cases of carcinoma during five years, but of these in only 60 cases was a radical operation possible. Early recognition is essential if any real improvement in the results is to be obtained. The later the operation the wider must be the excision and the more severe the operation, with an increase in the shock, and in the likelihood of thoracic and abdominal complications.

There was a little diversity of opinion as to the relation of carcinoma to simple ulcer of the stomach, but most of the speakers agreed that if chronic gastric ulcers were treated by excision, the number of gastric cancers would be reduced.

CANCER AND THE PUBLIC HEALTH.

THE discussions on the public health aspects of cancer on the last day of the Conference revealed a mass of painstaking labour. The achievement, however, was rather that of getting rid of unprofitable theories than in advancing new propositions. An immense amount of useless lumber has been cleared away in preparation for the edifice which will ultimately arise, but it is clear that the foundations of the future edifice are not yet dug.

The first discussion concerned geographical and racial prevalence of cancer. Certain facts were clearly brought out. One of the most important was the difference in mortality from cancer of the breast and uterus among the women of England, Holland, and Italy. For cancer of the breast the death-rate in the Netherlands is a little over one-half that of England and Wales, and in Italy it is about one-half that of the Netherlands. Another point is, that while the death-rate from other forms of cancer is substantially correlated with mortality from non-cancerous diseases, no reliable correlation can be discovered between cancer of the uterus and breast and fatal non-cancerous conditions. Prolonged and exhaustive inquiries from the statistical, clinical, and other aspects have failed to reveal the cause of these discrepancies. They are not due to differences of age or constitution, or to the proportions of married women in the groups. Differences in treatment do not explain them, nor do racial factors, exhaustively studied by many speakers, serve to elucidate the problem. One of the most illuminating papers was that by Dr. Sourasky on the incidence of cancer among Jews. He was able to show that race had nothing to do with it, but he explained the low incidence of cancer of the penis and uterus among Jews by their observance of the Mosaic code. The inference is that a more careful study of environment might bring an answer to some of the problems of geographical prevalence of cancer. The conclusions of most speakers with regard to racial prevalence were tentative owing to insufficient data, but the consensus of opinion was that race could not be invoked in explaining the distribution of cancer mortality.

A discussion on public action in regard to cancer should have as its corollary recommendations on action to be taken. The public naturally want to know what is to be done. What practical answer can the conference give? A perusal of Sir George Buchanan's paper shows that the Ministry of Health is not idle, but he supplies a statement of problems, rather than a categorical answer to questions of practical politics. Indeed, to the question, how cancer can be prevented, the answer can only emerge through continuous intensive study. But, as a result of their studies, members of the conference were able to explode many fallacies such as that diet caused cancer, or that the disease does not occur in native races. With regard to prevention, the only thing which can be done is to attend to general hygiene, remove sources of chronic irritation, and treat conditions which are known to lead to cancer. With regard to therapeutics the outlook is more hopeful. Modern methods of radiation may help to induce patients to seek advice earlier by allowing them to feel that they need not necessarily undergo an operation. Notification of cancer was suggested, but most speakers felt that at the present state of our knowledge it would have no value. A proposal, which although theoretically excellent was thought by many to be unsuitable to English conditions, was the establishment of cancer clinics. There seems to be a prejudice in the minds of the British public against such places. The divergence of views on the subject of propaganda was extremely interesting. Often, of course, the views held were a reflexion of national characteristics. Sir George Buchanan was undisguisedly thankful that propaganda had nothing to do with his department. Prof. Maisin, of Belgium, insisted that the best form of public education was the education of the practitioner. Lectures and popular instructions were only secondary and must be used with prudence. Dr. George A. Soper, of New York, blazed forth propaganda—books, pamphlets, posters in 20 languages, moving pictures and radio, newspapers and "cancer weeks." He reckoned he had reached 41,000,000 people every day for two weeks by one series of newspaper articles. Dr. Reimann, who followed him with cold statistics on the time elapsing between the patient first noticing a pathological condition in the breast and coming for advice, found there was no indication that the educational campaign going on since 1914 had had any effect. The pith of the matter was voiced by the President who warned enthusiasts to beware of fussing over public health. This is a view which appeals to the British public, and whatever sensational methods may succeed elsewhere, propaganda in this country must be adjusted to the prejudices of the people if it is to be effective in influencing their mental outlook.

THE SECTIONAL DISCUSSIONS.

THE main work of the Conference was divided among a number of sectional discussions which took place concurrently in the mornings. Tuesday has already been reported, Wednesday to Friday follow.

WEDNESDAY, JULY 18TH.

CLASSIFICATION AND TREATMENT OF BONE SARCOMA.

Prof. J. EWING (Cornell), opening the discussion, at the Section of Surgery, Sir CHARLES GORDON-WATSON being in the chair, claimed that a classification of the sarcomata of bone had much more than an academic interest. The classification proposed some years ago by Codman, of Boston, who suggested the registry of bone sarcoma, was very convenient, though it was not perfect. This registry had been taken over by the American College of Surgeons. Since sarcomata of bone were rare it was only by an accumulation of the experience of many surgeons that right views could be formed of the true nature of these growths, and the best methods of treatment of the several varieties. The registry had now very full notes of over 900 cases, classified into four classes: osteogenic sarcomata (i.e., sarcomata derived from bone), giant-celled growths, myelomata, and liposarcomata. Prof. Ewing discussed the varieties and explained their relations to one another. As to treatment, Prof. Ewing pointed out that the first and almost invariable symptom of bone sarcoma is persistent unexplained pain in a bone. Such a pain called for a provisional diagnosis of sarcoma, and then a careful radiographic examination would generally detect the presence of the growth, and in this way early treatment was possible. When the signs pointed to a true osteogenic sarcoma of medullary, subperiosteal, sclerosing, or telangietic type the best treatment was probably immediate amputation, immediately preceded, if necessary, by a biopsy. With nearly all other forms of bone sarcoma radiation competed with surgery in treatment. The more malignant the tumour the better was the response to radiation and the worse the outlook from surgery. Bulky tumours and those with much destruction of bone did not give a good result with radiation and amputation should be performed. The more malignant varieties were generally fatal with any method of treatment. If one considered the difficulties of diagnosis, the severity of the standard of treatment, and the high mortality, the conclusion must be drawn that the present-day treatment of bone sarcoma was very unsatisfactory.

Mr. W. SAMPSON HANDLEY (London) said that in the vast majority of periosteal sarcomata of bone amputation was followed by recurrence; he was inclined to think that the use of radium was the best means at our disposal for dealing with them. In one case he employed 500 mg. of radium for 24 hours and the patient was well nine years after. The surgeon must not be afraid of causing necrosis of bone if he wished to be sure of destroying the whole of the growth. Ultimately the necrosed portion of bone would be separated. In children the risk of producing necrosis was small. As to the ultimate result of radium treatment its great value was shown in one case, in which some months after the growth had been destroyed the patient found the limb so useless that he asked to have the limb amputated. This was done and the bone which had been affected with sarcoma was very carefully examined; no trace of malignant disease could be found in it. Out of four cases of osteosarcoma of the ilium three had been cured. The method of treatment was to turn back a skin flap and then a gluteal flap; the projecting mass of the sarcoma was cut off with a chisel, and a ring of radium tubes was inserted in the growth, with some other tubes within the ring.

Dr. WILLIAM B. COLEY (Cornell) maintained that in periosteal sarcoma of bone amputation was practically useless, though it might be employed with the toxin which he had devised. The toxin had a very definite value, though its use required very great care.

Mr. JULIAN TAYLOR (London) said that in order to understand sarcomata of bone it was of the greatest value to make skiagrams of thin sections of the affected bone, and he stated that in all the tumours he had examined the effects to be seen were those of invasion of the various parts of bone by the malignant tumour. That proved that a malignant stimulus had been applied and that the effects upon the various parts of the bone were essentially the same whatever the nature of the malignant growth.

Dr. CHANNING SIMMONS (Boston) praised the American registry of bone sarcoma. He stated that amputation was the best treatment in very early cases. He had found radium very useful, especially where the growth had arisen as the result of trauma.

Prof. FICHERA (Pavia) laid stress on the value of radiograms in the diagnosis.

Dr. FRANKLIN MARTIN (Chicago) explained the arrangements made of the registry of bone sarcoma, and suggested that it might be used not only in Canada and the United States, but also in other countries.

Mr. R. C. ELMSLIE (London) said that primary endosteal sarcoma was the rarest form. The diagnosis of bone sarcoma had to be made partly by the site and partly by the radiogram, but there was only one certain method, and that was by exploration and the microscopic examination of a small portion removed. He considered that in cases of myeloma curetting was a much more valuable method of treatment than many surgeons seemed to think.

Prof. M. J. STEWART (Leeds) expressed the opinion that a giant-celled tumour was a special tumour of bone. He considered it wrong to call it a myeloma, since it arises not from the bone-marrow, but from the fibrous endosteum and osteoblasts. He suggested the name osteoblastoma.

Prof. ARCHIBALD YOUNG (Glasgow) described an interesting case. A young woman had a bone tumour removed from the mandible 12 years ago. Subsequently similar tumours appeared on several bones; eight years ago some of these were removed from the ribs and elsewhere and later still similar tumours affected nearly all the bones. The skull showed Paget's disease. On microscopic examination of the tumours removed both sclerosis and rarefaction were present.

Mr. HANDLEY remarked that Coley's fluid was useful as an adjunct to radiation.

Prof. EWING, in reply, stated that he had been struck by Mr. Handley's method of removing a portion of a bony tumour and embedding radium within it.

SOME PRESENT-DAY MEDICAL ASPECTS OF CANCER.

Sir WILLIAM WILLCOX, who presided at this Section, began by calling on Sir THOMAS HORDER to open a consideration of

Cancer Cachexia.

Although, he said, there were causes enough to explain the condition, these were independent of the presence of malignant cells; the question should therefore not be judged to be solved by assumptions, however probable. He went on to put forward the suggestion that there might be something specific in the cachexia of cancer, study of which might be of service both in diagnosis and pathogenesis. In illustration of this, one had only to assume that the cancer cell might contain an intracellular microorganism which on disintegration of the cell might liberate a toxin of specific qualities; the cachexia produced by benign tumours undergoing necrobiosis would serve as controls. Treatment, he considered, should prolong life without adding to the patient's discomforts and produce the best possible material for surgeons and radiologists to work on.

Dr. WILLIAM HUNTER remarked that the degree of cachexia was nothing now to what it was 30 years ago. He considered all sources of sepsis should be treated besides that due to the cancer itself.

The CHAIRMAN said the subject of cancer cachexia was a very important one and should be approached from the point of view of: (1) cancer toxæmia; and (2) other sources of sepsis. He added that Sir T. Horder had foreshadowed a possible specific treatment.

Sir JAMES DUNDAS-GRANT considered that the general practitioner's point of view—"How can this be cancer if there is no cachexia?"—was a dangerous one.

Alleged Increase of Cancer of the Lung.

Dr. ROBERT HUTCHISON said that the general impression amongst clinicians in recent years was that there was a considerable rise in incidence of primary cancer of the lung. He showed records of autopsies performed at the London Hospital which bore out this statement. As for ætiology he mentioned three theories: 1. The supervention of cancer on the catarrhal changes in the lungs associated with influenza, pointing out, however, that cancer of the lung began often as an acute illness and might simulate influenza. 2. Irritation of the lungs by tar dust from roads. 3. A possible connexion between pulmonary tuberculosis and cancer; this was not substantiated at autopsies.

Dr. L. S. T. BURRELL said that malignant disease of intrathoracic viscera was seen in three main groups: (1) endothelioma of pleura; (2) carcinoma of lung; and (3) sarcoma of mediastinum. He agreed that primary carcinoma of the lung had become more common of late, and said that it often started acutely owing to the growth ulcerating into a bronchus and producing collapse of lung. Diagnosis, he said, had become easier because of: (1) artificial pneumothorax enabling the relation of lung to tumour to be seen; (2) examination by thoracoscope; (3) examination by bronchoscope; (4) X ray examination after injection of lipiodol. In treatment the only possibility of cure lay in lobectomy: X rays and radium temporarily diminished the size of the tumour.

Dr. C. POWELL WHITE (Manchester) read a paper prepared jointly with Prof. SHAW DUNN and showed slides of graphs made from records of autopsies on primary malignant growths of the thorax from Birmingham General and Queen's Hospitals, Edinburgh Royal Infirmary, Glasgow Western Infirmary, Leeds General Infirmary, London, University College Hospital, Manchester Royal Infirmary, all of which with one exception—Leeds—showed an increase in the incidence of intrathoracic neoplasms during the past 25 years.

Prof. T. SHENNAN (Aberdeen) said the occupations of the cases he had examined were varied, therefore of no ætiological value. The predominant growth was a small-celled carcinoma (the oat-seed cell type described by Barnard). In all there were areas impossible to distinguish from short spindle-celled sarcoma. He had himself come to the conclusion that the spindle shape was the result of mechanical influence on the plastic cell substance. As possible predisposing factors he suggested old-standing pulmonary disease and "gassing" during war service. Prof. Shennan then showed slides and microphotographs illustrating his paper.

Dr. W. G. BARNARD (London) showed microphotographs proving that the majority of tumours diagnosed as sarcomata of the mediastinum were in reality medullary carcinomata of lung. He said that histologically parts of a growth might show typical oat-shaped cells, but other parts of the same growth showed transition to carcinomatous tissue—i.e., polygonal cells and tendency to squamous epithelium; oat-shaped cells could also be found in carcinomata.

Dr. LEONARD HILL (London) said he had been feeding mice on different diets and had found the spontaneous cancers of the lung—to which mice were very subject—were uninfluenced by diet.

Prof. DUNCAN GRAHAM (Toronto) endorsed former speakers' experiences in regard to the increased incidence of primary cancer of the lung. He considered the sudden onset of symptoms were due to ulceration of the growth into a bronchus with mechanical obstruction. He did not consider influenza an ætiological factor.

Dr. J. C. TULL (Singapore) and Dr. J. ANDERSON (Hong-Kong) both gave as their experience that primary carcinoma of the lung was rare in their respective districts: they said, however, that primary carcinoma of the liver was commonly associated with biliary cirrhosis, possibly due to the fact that 85 per cent. of patients had had syphilis.

Dr. W. C. MACCARTY (Mayo Clinic) considered the increasing incidence of cancer of the lung as a great problem in the near future.

Dr. A. T. TODD (Bristol) suggested arsenic as an ætiological factor in view of its general use in treatment.

The CHAIRMAN said that it was helpful to get the experience of medical men from all parts of the world, and that it was interesting to know that new growths of the lung were carcinomatous and not sarcomatous in origin.

Dr. HUTCHISON, replying, said that general opinion agreed that there was a definite increase in the incidence of primary cancer of the lung. Little light had been thrown on ætiology; he viewed with diffidence Prof. Shennan's suggestion that preceding lung disease was a factor, since the growth itself set up chronic inflammatory changes. He thought there was no evidence that "gassing" or arsenic favoured malignant growth, and diet was known to have no influence.

BIOLOGICAL EFFECTS OF RADIUM AND X RAYS.

Prof. SIDNEY RUSS took the chair at this discussion, when special reference was made to the factors of wave-length, intensity of radiation, and duration of exposure.

Prof. C. REGAUD (Radium Institute, Paris), who opened, said that experiments on the normal tissues of higher animals showed a varying reaction in different tissues if changes were made in intensity of irradiation and duration of treatment. With regard to human skin, Friedreich and Krönig showed in 1918 that, given the same quantity of radiation, earlier and more marked effects were produced when the dose was given in a shorter time. When a dose was spread over a long time the effect was progressively less. In the latter case, therefore, the total dose should be augmented. But it was a mistake to suppose that the experimental results obtained with human skin could be applied to other tissues. In 1927 Ferroux and Regaud, working with X rays, showed that sterilisation could not be produced in the male rabbit without causing necrosis of the skin. When a massive dose was used, however, it was filtered. On the other hand, sterilisation could be easily and constantly produced without causing any serious and lasting lesion of the integuments if the dose was extended over five days. Behaviour of different tissues varied under different periods of exposure. *The explanation, he thought,* must be sought in the alternation of the radio-sensitivity of the cellular stocks, which were dependent on the renewal processes of the normal and neoplastic tissues.

Prof. H. HOLTHUSEN (Hamburg) said the quality of rays must be chosen according to the depth of the focus to be treated. In the case of superficial diseases soft rays were preferred, while for deep therapy strongly filtered rays of high intensity were preferable. No quantitative rules had been made. One rule which had been impressed upon him was that the skin-tolerance dose should not be exceeded in applying a certain focal dose. It seemed clear that there was no difference between the strength and the biological effect of hard and soft rays within the limits of technically employed rays, including the supra-soft rays. Pathological conditions responded better if the dose of radiation decided upon were spread over a number of days or weeks.

Dr. D. QUICK (New York) read a paper in which his purpose was to correlate some of the experimental findings with clinical observations. In experimental work variations were bound to occur, and no single angle of approach would afford an adequate survey of such a complex subject. There was a wide variety of opinion as to the wave-length which should be employed. In discussing the possible reason of reactions occurring, he said too much was usually based upon physical measurements. Did it follow that the rays which were calculated as being given were all absorbed? He was sure that the proportion of energy absorbed differed with each organ. He did not depreciate the value of biological research, but submitted that there existed an equal need for careful clinical observations, based on trial on the *human* subject.

Dr. G. BUCKY (New York) pointed out the peculiar position occupied by the skin in the matter of response to radiation; it differed from all other organs. He gave results on the skin of the use of 100, 60, and 30 kv.

Dr. R. G. CANTI (London) spoke of the relationship of *radiation effects to the factors* of intensity and time, and said there was a threshold of intensity of radiation below which no biological effect took place. Similarly, there was a threshold of minimum time, which had to be exceeded for results to occur.

Dr. N. S. FINZI (London) confined his attention to the question of the latent period, which he regarded as of probable importance in discovering the mode of action of radiation. The definition of latent period was "the space of time after the *application* of radiations before some of their effects become obvious." The larger the dose the shorter was the latent period. The latent period varied greatly according to the tissue receiving the dose. The salivary glands had a latent period of only a few hours, as shown by the stoppage of salivary secretion. The latent period for dry skin was 17 days—i.e., the time at which erythema began to appear; also, with the same dose, it was the time at which hair *fell* out.

A regrowth of hair took place in three months. Another generalisation he gave was that the longer the wave-length of X rays the shorter was the latent period, and vice versa. But there was a large range of medium wave-length for which the latent period was the same. An important adjuvant was moisture. If the skin was kept moist the latent period was half what it was in the dry state. Heat shortened the latent period, especially moist heat, as also did the presence of metallic salts on the skin.

Dr. L. **Mallet** (Paris) said that gamma rays were specially efficient for epithelioma of the mouth and cancer of tongue, palate, tonsil, and pharynx. In all forms of cervical cancer only X rays gave a good result.

Prof. F. C. **Wood** (Columbia) emphasised the variability in resistance to radiation of all kinds of biological material, and described the method of inquiry being pursued at his centre. Their conclusion was that so long as the rays reached the depth required the actual wave-length was not important.

Other speakers were Dr. S. N. **Waterman** (Amsterdam), Dr. A. **Piney** (London), Prof. W. **Duane** (Harvard), Dr. W. C. **Stevenson** (Dublin), and Colonel S. **Mort** (London).

The **Chairman**, in summing up the discussion, said there was much difference among radiologists as to whether the biological effects of X rays depended on the wave-length. It was a case of attempting to make generalisations when there was no basis for them. The question did not arise in the laboratory, but was primarily due to clinicians. Some workers had gone as far from the clinical as possible, using ova of various organisms and calculating as far as they could the energy absorbed by these ova. Efforts were now being made to settle the question without biasing the mind by the use of ova.

OCCUPATIONAL CANCER.

The Section of Pathology, Statistics, and Public Health met under the Presidency of Prof. W. S. **Lazarus-Barlow**.

Drs. J. C. **Bridge** and S. A. **Henry**, of the Home Office, presented a statistical review of industrial cancer in this country. They recommended, as the only effective prophylactic measure, the substitution of innocuous bodies for those with known carcinogenic properties. If this were impossible, early detection and treatment were the only measures. Inquiries had not elicited a single case of cancer in the X ray industry. They suggested that research into occupational cancer of the skin, especially among women, would yield valuable results.

Dr. T. H. C. **Stevenson** (London) spoke of the importance of social distribution; nonconformist and Anglican clergymen occupied the first and second places in a list of 178 occupational groups arranged in reverse order of cancer mortality, while Roman Catholic priests came sixteenth. The certified mortality of the clergy from syphilis was also remarkably low. Comparison between cancer and alcoholism as measured by cirrhosis of the liver, showed similar but less striking results, and Dr. Stevenson concluded that both syphilis and alcohol had a carcinogenic influence.

Prof. G. **Schmorl** and Dr. O. **Rostoski** (Dresden) described the endemic lung cancer of the miners of Schneeberg; they regarded the anthra-cochalicosis scars from which the men suffer as pre-cancerous and left undetermined the primary causal factor. The radio-active dust in the Schneeberg rock might play a part. In six cases multiple primary tumours had been found, and in four there was a latent period, after ceasing work, of 10–18 years.

Dr. **Alexander Scott** (Broxburn) described the more prevalent lesions caused by semi-refined and crude mineral oils and paraffin—viz., papular dermatitis, erythrodermia, and epithelioma. The cancer incidence in the works of Scottish Oils, Ltd., among 5000 men, was less than 0·1 per cent. per annum. The chief predisposing factors were age, length of service, and idiosyncrasy. Early detection, by periodic examinations, was the most valuable prophylactic measure. Multiple primary growths were common.

Mr. A. H. **Southam** (Manchester) gave an account of mule-spinners' cancer, in the ætiology of which idiosyncrasy and dry skin played an important part. The condition could easily be detected at an early stage and excision was satisfactory except in the case of the scrotum, where glandular involvement was more frequent. Multiple primary growths were occasionally encountered.

Dr. L. **Carozzi** (Geneva) discussed occupational cancer, pointing out the inadequacy of present methods of detection. He pleaded for an international medical inquiry on uniform lines, and for a set of guiding principles for revelation and detection of the injurious element in each "carcinogenic" industry.

Dr. A. F. **Sladden** (Swansea) described the epithelioma of South Wales patent-fuel workers, ascribed to gas-works pitch. Usually the growths were superficial and of low malignancy. Systematic medical inspection and prompt removal of warts were important prophylactic measures. The scrotum was the most dangerous area.

Prof. W. J. **O'Donovan** (London) presented a clinical review of occupational skin cancer due to tar, arsenic, oil, and X rays. He pointed out the frequency of a latent period and of multiple primary growths. The prognosis for early cases of tar cancer was very good, and treatment by flat plates of radium was satisfactory. The possibility of actinogenic carcinoma required investigation. He pleaded for a centralised record of amputated carcinomatous hands.

Dr. W. M. **DeVries** (Amsterdam) said that occupational cancer was rare in the Netherlands; cases had occurred in briquette factories, where pitch-dust was in the air.

Dr. F. L. **Hoffman** (U.S.A.) discussed the statistics of cancer incidence and mortality among industrial workers. Estimation was difficult in America because the men very frequently changed from one establishment or from one occupation to another. Dr. Hoffman had been unable to find any record of a case of cancer among lead workers.

Dr. E. L. **Kennaway** (London) discussed statistical data of 921 fatal cases of cancer of the penis and scrotum; the ratio of scrotal cancers to cancers of the penis was lowest among agricultural workers, lower in clerical than in manual workers, and lower in those doing light than heavy work. He suggested that cancer of the scrotum affected especially those who washed least and were exposed to the dust of towns.

THURSDAY, JULY 19TH.

RELATIVE VALUES OF SURGERY AND RADIATION.

Mr. J. P. **Lockhart-Mummery** took the chair at the resumption of the discussion, commenced on Tuesday morning, on the relative values of surgery and radiation in the treatment of cancer of the cervix uteri, rectum, breast, and buccal cavity. Prof. **Burton Lee** (New York), opening, spoke on conservatism in the treatment of

Primary Operable Cancer of the Breast.

He held that conservative surgery deserved as much credit in his results as radiation therapy, and preferred the combined use of the two methods to radical surgery with radiation. Radium was more effective in mammary cancer than X rays; it was especially suitable for patients who also had an intercurrent chronic disease and for those who rejected radical surgery.

Mr. W. **Sampson Handley** asked: 'Can either radiation or operation alone cure breast cancer?" He showed slides proving that surface radiation could destroy or arrest the growing edge of a group of permeated lymphatics, but concluded that, owing to the great extent and depth of the surface to be treated, it was unsafe to trust to radiation alone. Although the primary growth and the enlargement of the glands might disappear dissemination continued. Operation alone might at first sight appear to be sufficient, but an analysis of his recurrences showed that breast cancer, when it came to operation, was usually already a thoracic disease, and therefore that no operation was complete unless a systematic attempt were made to deal with the intrathoracic extension of the disease by buried radium. For the present surgery and radiology must be colleagues, not competitors. Buried tubes generally relieved, and might cure, recurrent breast cancer when the surgeon was helpless. For supraclavicular recurrence a combination of excision with buried tubes gave the best results, but it was useless to try to excise fixed supraclavicular glands.

Dr. **ROBERT KNOX** (London) compared Dr. Janet Lane-Claypon's figures of the results of surgery in 2000 cases with those of a small series of patients treated with X rays. Surgery gave appreciably better results in early cases, but in second-class cases the rays seemed to hold the advantage with 53·6 per cent. of cures against 42·1 per cent., and in the worst cases there was no comparison. Buried radium had not yet proved its value.

Mr. **GEOFFREY KEYNES** and Dr. **J. H. D. WEBSTER** (London) summarised papers which appeared in THE LANCET of July 21st and 14th respectively.

Cancer of the Mouth.

Dr. **DOUGLAS QUICK** (New York), in his opening paper, said in no other group of cases was radiosensitivity so important as in this; the more adult the type of a growth the more resistant it was. Treatment by external radiation would produce complete regression in the more embryonal types of growth, but for squamous-celled carcinoma the application of radon in gold capillary seeds was also necessary. This method, in his clinic, was applied, in the maximum intensity consistent with tissue tolerance, to the local lesion and to both sides of the neck. Mouth hygiene was important, but bad teeth should not be extracted until after irradiation had produced its maximum effect. Prolonged moderate doses were preferable to short intense ones. Surface applicators within the mouth were not recommended. Surgery was not used in direct treatment, but was often a necessary auxiliary to give access to the tumour, to remove bone in cases of secondary invasion, and to remove bulky masses after irradiation.

The treatment of metastases of the neck glands was more important than that of the primary growth. External radiation was sometimes assisted by buried seeds; the 4-g. radium pack was better than X rays, but good X rays were better than inadequate radium. Once the disease involved both sides of the neck it was regarded as incurable.

Mr. **STANFORD CADE** (London) concluded, from a study of 50 cases, that the treatment of election in mouth cancer consisted of three stages: radium therapy of the primary growth, surgical removal of the cervical glands, and post-operative distance-irradiation of the cervical area. Radium gave the only hope in metastatic involvement of the neck.

Prof. **G. E. PFAHLER** (Philadelphia) described the use of pure γ radiation, which was painless on application, produced no mutilation or constitutional symptoms, preserved the function of the tongue, and usually caused the disappearance of metastatic lymph nodes.

Dr. **B. E. ROSE** preferred the diathermy knife for inoperable growths, with irradiation after about a month. Inoperable growths should be treated by radium unless the alveolus were extensively involved, when they should be left alone. The gland fields should be excised if possible and the wound irradiated, but the results of irradiation on inoperable glands were bad.

Evaluation of Statistics.

Dr. **JANET E. LANE-CLAYPON** (London) laid down in her opening paper the fundamental necessities of any statistical inquiry. Only by rigorous statistical methods, she held, was it possible to estimate the advisability of modifications in practice or the value of other agencies.

Prof. **F. C. WOOD** (Columbia) and Prof. **JÜNGLING** (Stuttgart) pointed out the urgent necessity of minute histological subdivision of the various classes of patients in assessing the value of various therapeutic methods. The former postulated that deaths of untreated or rejected patients should be taken into account, and the latter pleaded for an international standard, without which it was impossible accurately to correlate one set of figures with another.

CHEMOTHERAPY, WITH SPECIAL REFERENCE TO LEAD.

Sir **THOMAS HORDER**, who presided at a discussion on the lead treatment of cancer and other methods of chemotherapy, appealed to the speakers to deal with the issue on a clean slate, dismissing from their minds any attempt at prejudgment on ill-digested material.

Prof. **BLAIR BELL** (Liverpool) read the paper which appears on p. 164 of our present issue.

Prof. **F. C. WOOD** (Columbia) thought no one would deny that lead would have an effect on malignant disease in the human subject, but he considered that a greater effect followed X rays. There were cases that yielded entirely to lead. Both lead and gold colloid had been used by him in experiments on rats. His conclusion was that the optimum period for those metals was after the first dose of X rays. The fact that tumours did not alter in size did not mean that they had not been seriously damaged by the treatment and their growth checked.

Dr. **BURTON SIMPSON** (Buffalo) spoke of 19 cases of malignant disease which had been treated with colloidal lead, prepared according to the Blair Bell method, all in an advanced stage of the disease, and had already had surgery or radiation or both. Careful urine and blood analyses were made each day. No clinical improvement was observed in any of the cases, but very soon after the administration there was a severe toxic action on the blood, with secondary anæmia. Nausea and vomiting were frequent, and some of the patients had pronounced jaundice. Only one of the 19 cases was now alive. The treatment had now, owing to the suffering of patients, been abandoned at the institute. Dr. Simpson said this unfavourable impression was supported by all whom he had heard from on the subject.

Prof. **WALTER DILLING** (Liverpool) thought that no final estimate of the therapeutic value of lead was likely to be reached for a considerable time. Lead seemed to exert a special action on growing tissues of embryonal type and sublethal concentrations of lead ion retarded growth, particularly in young animals. His experience was that while lead therapy produced marked benefit in some cases of malignant disease, it left others quite uninfluenced for good. It could not be regarded as parallel to the effect of arsenic in syphilis. Even slight modifications in the routine of preparation rendered the colloid less safe. He showed the results obtained by Prof. Heilbron, of Liverpool, in testing the toxicities of various organic lead complexes. Safe injections were colloidal lead phosphate, with three equivalents of sodium acetate and colloidal lead selenide. He related the results of searches for lead in normal tissues and found that spleen, liver, lung, and kidney contained the greatest proportion.

Mr. **BASIL HUME** reported the results of an investigation by a committee of St. Bartholomew's Medical College, every care having been taken to follow closely the Liverpool method, Prof. Bell having expressed his full approval of the method after a visit. He gave the details on which the following conclusion was based. In 13 cases treated by lead alone 11 died, after an average life from commencing the treatment of 13 weeks. The two survivors (carcinoma of breast) had not improved. Seven patients had deep X ray therapy after preliminary injections of lead colloid. In one case the lead was injected into and around the growth, as the patient was not suitable for the usual method. Of the other six, one received a full first and second course, two a first and a partial second course, and in the other three the whole or part of the first course only. In none of them was improvement demonstrable while under lead treatment. In a majority of the cases the growths increased very rapidly under the treatment, but none of the patients seemed to have died as the result of acute or chronic lead poisoning.

Dr. Stanley Wyard (Cancer Hospital, London) referred to his work on eosin and selenium, and said that success in treating cancer in animals by these had been claimed. No metal had been found by Caspari to be more potent than others. Prof. Bell had claimed better results from lead treatment than had any other worker. At the Cancer Hospital 56 cases had been treated with lead colloid, and the average duration of life after treatment was commenced was five months, but after receiving 0·3 g. of lead the average life was 7 months 3 weeks. Of 40 patients who received sufficient lead 23 died, 10 were worse, 6 showed no change, 1 was somewhat improved.

Dr. G. Loewy (Paris) referred to the finding of Waterman that lead had a curative action on transplanted rat cancer. In every human case, however, lead caused grave intoxication. He had been using colloidal oxide of lead in glycogen in an isotonic solution of 5 per cent. on dogs, which showed very fair toleration to it in a dose of 4 mg. per kilo of body-weight. The toxic dose was 5 mg. Clinical tests showed a remarkable human tolerance to the colloidal lead with glycogen, and the best dose was probably 50 mg. Women were more susceptible to it than men; it was stable and could be preserved for several months. No cure had, however, been obtained with it, but its innocuousness led him to resolve to continue its use.

Dr. A. P. Thomson (Birmingham) said that in 55 cases treated by lead the treatment seemed to influence the progress of the disease favourably in 15, though in most only temporarily. By the system of trial and error he thought it was possible to know within a short time of commencing the treatment whether it was likely to be successful. In the cases which improved the hæmoglobin had never fallen very low. Patients were not now given as large a dose as Blair Bell originally suggested.

Dr. H. F. B. Fry (London) spoke of the pathological changes seen by him in the fatal cases treated with lead by Dr. Wyard, especially in the kidneys and liver, which were most probably due to the lead.

Prof. Bell, in reply, remarked that little had been said on chemotherapeutical principles; the discussion had turned largely on clinical details. In Liverpool scientific curiosity was not allowed to outrun humanity, and for that reason attention had not been confined to lead alone; a goodly proportion of the 1000 cancer cases treated there had had deep X ray therapy in addition to lead. Every patient must be individually treated or satisfactory results could not be expected. Why was it that patients coming to him from London had been imbued with a fear of terrible reactions occurring? These allegations had been made in *Nature*, and that journal had refused to insert his rejoinder. He had brought the treatment to the state that made reactions practically negligible. The size of the growth after treatment was no criterion of its malignancy, for it might be cystic or necrotic. Nature did not proceed by leaps; one must not look for the miraculous. In answer to Mr. Hume, it was true he did what he could to help the work at St. Bartholomew's; his complaint there was that in 15 cases only half the treatment had been given, and conclusions based on these were not fair.

Dr. T. Lumsden (Lister Institute) gave an exposition on tumour immunity and the position of the attempts to kill cancer cells without damaging normal tissue. He suggested that those who treated tumours with radium should not try to get rid of the local growth too hurriedly, so as to cause sloughing, otherwise immunity was hindered.

Prof. F. Bang (Copenhagen) read a paper setting out the results of minimal optimal doses of metallic salts in increasing the defensive mechanism of the body.

Dr. M. Copeman (London) pointed out the good effect of surface applications of fluoresceïn prior to a mild dose of X rays in carcinomata. He showed a number of slides setting out the favourable results, and advocated an extensive trial of the method.

The Chairman, in summing up, dealt with three questions which had been raised in the discussion: (1) Have any patients got well after treatment by lead and (not to quibble) as a result of it? The answer, he thought, was in the affirmative. (2) Can we undertake the responsibility of advising patients to undergo lead treatment? I feel, he said, we have not yet arrived at the point of safety which will enable us to do this. (3) What are the next steps to take? Further search should be undertaken for lead preparations less toxic than those now in use, with the hope of widening the margin of safety, at present dangerously small.

Friday, July 20th.

Early Recognition and Treatment of Cancer of the Stomach

Sir Berkeley Moynihan opened by remarking that the symptoms described in the text-books were those of well-established disease, with organic changes so firmly rooted that there was little chance of complete removal of the growth. The early symptoms varied enormously in different cases. In some the onset of the disease was rapid and even in a very few weeks the tumour was found to be beyond the reach of the surgeon. In some cases the symptoms closely resembled those of duodenal ulcer, while in others they were simply those of dyspepsia, and might be temporarily improved by medicinal treatment. In other cases, again, the symptoms were those of obstruction, at either end or in the body of the stomach. Hæmorrhage might be an early and severe symptom, and sometimes a diagnosis of pernicious anæmia was made, while cases had been diagnosed as suffering from malignant disease of the stomach when the disease had really been pernicious anæmia. Thus it could be seen that the clinical picture was so various and so multiform that by observation of symptoms alone a correct diagnosis might not be possible. Different opinions were held as to the relation of cancer of the stomach to simple ulcer; but there could be no doubt that cancer might develop on a gastric ulcer, for when operating for gastric ulcer the surgeon might find that at one part of the simple ulcer there was a carcinoma; if the case had been seen later the malignant growth would have spread throughout the whole of the simple ulcer. It was important to recognise that cancer of the stomach, like cancer elsewhere, was certainly a local disease, and while it was small it was curable by operation. If the disease was allowed to reach a stage of extensive development the chance of complete removal was greatly diminished. In any cases occurring in a patient over 35 an early radiological examination was imperative, for in this way only was early diagnosis possible. The early infiltration of the muscle caused a loss of movement at the affected part. In any case of doubt an exploration of the stomach was essential.

Dr. A. F. Hurst (London) said that there could be no doubt that a chronic ulcer of the stomach could become malignant. He laid stress on the importance of looking for occult blood in the stools, and he agreed that X rays generally gave such a clear picture that the diagnosis was certain. The achlorhydria of cancer of the stomach was probably due to a chronic gastritis which preceded the appearance of the malignant growth. Hitherto the early diagnosis and treatment of chronic gastric ulcer had alone been considered in discussing the prophylaxis of cancer of the stomach, but it now appeared probable that chronic gastritis was a much more common precursor. It could be prevented by dental hygiene, the treatment of oral and nasopharyngeal sepsis and common sense dietetic rules. When present it could be cured by removal of the cause, together with lavage every morning with dilute hydrogen peroxide until no more mucus is removed.

Dr. EDMUND SPRIGGS (Ruthin Castle) pointed out that, though the newest methods, such as X rays and chemical tests, enabled us to recognise the presence and nature of the lesion at an early stage, the first suspicion must arise from the study of the earliest symptoms. It was not sufficient to say that a patient had indigestion and to treat this merely by medicine or diet; indigestion was not a diagnosis; it may be due to any one of many causes, but it must be remembered that the earliest manifestations of cancer of the stomach in no way differed from those of indigestion from other causes, except that the symptoms did not disappear rapidly with simple treatment. Dr. Spriggs detailed the main symptoms of carcinoma in the order of their appearance: discomfort in the abdomen apart from food, loss of appetite, pain after food, heartburn, flatulence, vomiting, regurgitation of mucus, weakness, loss of weight, dysphagia, and tumour. In a few cases hæmatemesis was the first indication of the disease. A palpable tumour was always a late sign; as a rule it meant that the growth was inoperable, but not always. In any case in which the possibility of malignant disease of the stomach was suspected all the methods of diagnosis should be employed; the fæces should be examined for occult blood, the gastric juice should be tested, and X rays should be used. The earliest objective sign of cancer was probably local arrest of the peristaltic wave of the stomach as shown by X rays.

Prof. H. FINSTERER (Vienna) said that as a cancer of the stomach can be cured only by an operation, an operation should always be attempted as long as there are no signs of metastases, such as ascites and jaundice. The extent of the cancer largely influenced the operative results. If the disease was limited to the stomach and only the stomach had to be resected, the immediate results were relatively good, for the operative mortality in his cases was only 5 per cent. Part of this good result was due to the use of local anæsthesia in elderly patients. If owing to involvement parts of the pancreas, liver, or colon had to be resected the operation mortality was far higher, over 37 per cent.; yet even in these patients resection was justifiable, for some had survived for 5 to 13 years. To get good permanent results the operation must be very radical, the whole lymphatic area must be removed, even if the glands were not apparently diseased. The whole of the greater and lesser omentum also must be removed. In 18·5 per cent. of his cases the cancer had developed in a simple ulcer.

Prof. RAFFAELE BASTIANELLI (Rome) reviewed his personal experience of 543 cases. The mortality of 239 resections was 28 per cent.; of 176 gastro-enterostomies, 21·5 per cent.; and of 118 explorations, 15 per cent. The mortality figures of any surgeon depended largely on the sort of case he would undertake to operate upon. Prof. Bastianelli's guiding principle was to remove the stomach as often as the anatomical conditions would allow and as extensively as possible. A great part of the operative mortality was due to thoracic complications. For several years he had employed local anæsthesia in gastric operations, giving a general anæsthetic in addition only where necessary. He favoured a Polya Reichel technique. A study of the recurrences was of importance in determining the extent of an operative technique, and a general routine ought to be adopted in all advanced cases. He did not think that the ovaries are affected from stomach cancer by cells dropping on to their surface, but that the invasion occurs from the hilus by lymphatic spread. Surgical technique had now reached a very high level, but it could not be expected that more than 7 per cent. of patients with stomach cancer seeking advice would be likely to be cured. It was therefore essential to study precancerous lesions, to use preventive surgery, and to recognise the earliest symptoms of cancer.

Prof. M. J. STEWART (Leeds) pointed out that it is generally possible to decide whether a cancer is arising from an ulcer. In an ulcer of the stomach there is a definite destruction of the muscular coat with a turning up of the ends of the bundles of fibres. In 239 cases of cancer of the stomach there were 15 per cent. in which the growth had certainly started from a simple ulcer. He showed some striking slides in which cancer of the stomach was associated with a large number of gastric polypi.

Mr. A. J. WALTON (London) stated that there is no evidence that gastric cancer is increasing; in fact, in his own practice, it is becoming a less frequent disease, and this fact he was inclined to attribute to the fact that many patients have been saved from carcinoma by having their simple gastric ulcers treated surgically. As to the results of operation, between 1913 and 1924 he had performed 62 partial gastrectomies; of these 3 could not be traced. Subsequently, 55 had died of recurrence and 4 were still alive. Of these 4 one had lived 15 years, one 12 years, one 10 years, and one 7 years. To better the results it was, in the first place, essential that a correct diagnosis be made earlier; in the second place, since a certain number of cases arise in simple ulcers, these should be treated surgically if they did not respond readily to medical treatment.

Prof. D. P. D. WILKIE (Edinburgh) mentioned that in over 44 per cent. of all cases of cancer the stomach is affected. It was an insidious disease and early diagnosis was essential if any real benefit was to be derived from operation. Among 675 cases admitted into the Royal Infirmary, Edinburgh, only in 60 cases was a radical operation possible. Examination by X rays after a barium meal was by far the most valuable form of evidence, though it was not absolutely infallible, for in some malignant cases a diagnosis of a simple ulcer has been made. Since there was a chance of error in all available diagnostic methods the question of an exploratory incision should always arise where doubt existed. It was advisable that everyone should be submitted to periodical medical examination; for then in many cases malignant disease would be recognised at a stage when operation would be most valuable. Treatment by radiation offered less hope in this than in almost any other form of cancer.

Dr. MACCARTY quoted the statistics from the Mayo Clinic. Of 1680 cases of operation on the stomach 869 were for chronic ulcer and the remainder were for cancer. The operation mortality of the cancer cases was 9·5 per cent.

Mr. HERBERT W. CARSON (London) said that the cause of the low percentage of cancers of the stomach suitable for operation was that patients came to the surgeon at too late a stage. Middle-aged or old men should not be treated for indigestion until cancer had been ruled out. The earliest sign was generally loss of appetite, followed by loss of energy and wasting. If at an operation the complete removal of the disease was impossible, benefit and increase of comfort would often follow a jejunostomy.

Sir BERKELEY MOYNIHAN, in reply, urged that diagnostic methods should be cheapened, and this he regarded as the duty of the Government. It would pay insurance companies to charge reduced premiums to a person who could at intervals of six months produce a certificate that he had undergone a thorough examination by a competent doctor. Cancer of the stomach, as cancer elsewhere, is a local disease, which should be recognised and removed at the earliest possible moment.

DIAGNOSTIC METHODS IN RELATION TO CANCER.

Sir WILLIAM HALE-WHITE being in the chair. Sir THOMAS HORDER opened the discussion on this subject. Since, he said, we believe the disease to be a local condition in the first stages, early diagnosis was imperative; a difficulty of paramount importance was introduced, however, by its local character, since it deprived us of serological and analogous methods dependent on generalised effects. Diagnosis, he went on, presented three stages: First, a local change with no general disturbance, the curable stage; secondly, dysfunction of the part with anatomical change; thirdly, the stage of cachexia. In early diagnosis he placed great value on the significance of symptoms—he could hardly emphasise sufficiently the importance of dyspeptic symptoms in a patient previously perfectly well; he thought the school which taught that cancer intervened on chronic dyspepsia and other conditions were entirely wrong; in the majority of patients the disease arose in healthy organs. He pleaded for simplicity of technique in laparotomies; patients might then be more willing to submit to them. All additional aids should be employed when suspicious symptoms arise—radiology, biopsy, serology, hæmatology, and biochemistry.

Dr. T. Izod Bennett (London) said that treatment was a pious hope for the future, early diagnosis was the problem for to-day. Prognosis in cancer of the stomach was at present far worse than cancer in any other situation since early symptoms were so insidious and access to the organ was difficult. There were, he said, three diagnostic procedures of great value. X ray photography was the method of first choice, a loss of mobility appeared before a filling defect, also the presence of an ulcer in a patient whose history was of brief duration should raise suspicion of malignancy. He gave no support to the theory that malignancy supervened on chronic ulceration. Gastric analysis, he said, when carefully performed, yielded reliable diagnosis in about 90 per cent. of cases; signs were often most conspicuous in the fasting content. Lactic acid, when present, was said to establish the diagnosis beyond question. Finally, gastroscopy, he thought, was a method for the future, although at present disappointing. Serological tests would be unlikely, he thought, to diagnose cancer at a curable stage.

Dr. MacCarty (Mayo Clinic) said the dominant theme in America was "Bring your sores and lumps to the physician early." In his opinion no cancer was early if larger than ½ cm. in diameter. X ray examination by an expert would tell if there was a lesion in the stomach, and ulcers should be excised because diagnosis of malignancy could not be made. The speaker showed a chart illustrating stages in development of cancer from gastric ulcers, and said that 39 of 869 cases showed malignant change. Malignancy could be expected when the average diameter was 2·17 cm.

Prof. L. S. Dudgeon described his technique (published in the *British Journal of Surgery*, 1927) for making rapid wet-film examinations of neoplasms. He said that autolysed tissues and fixed tissues were unsuitable for investigation. Considerable skill was necessary, but he could now diagnose correctly in 98 per cent. of cases.

Prof. Lewis (Liverpool) said that normal blood serum acting on pancreatic lipase augmented its lipolytic power. In certain conditions, including cancer, the lipolytic augmentation was reduced. He showed tables to prove that in cases treated with lead clinical deterioration went hand in hand with a decreasing lipolytic augmentation, whilst improvement accompanied a rise.

Prof. Blair Bell said that while the lipase coenzyme activity of the serum was not a specific diagnostic method, it was of great value in assessing the progress or retrogression of malignant disease.

Prof. Ascoli (Catania) said he saw the immediate future of sero-diagnosis of cancer in the methodical research in non-specific reactions.

Dr. H. J. B. Fry (London) described a flocculation reaction in routine use at the Cancer Hospital for the sero-diagnosis of malignant disease. In 1550 malignant and control cases correct results were obtained in 73·3 per cent. The reaction appeared to depend on products of cellular or tissue disintegration.

Dr. J. Braxton Hicks (London) described work he and Dr. Hocking had undertaken to evolve a complement-fixation test for cancer. They were, he said, prepared from the beginning for negative results, since the fixed tissues of a part seemed so indifferent to the intrusion of cancer cells; their work was further complicated by deterioration of the antigens. The results proved inconclusive.

Dr. S. Melville (London) talked on diagnosis of intrathoracic neoplasm by X rays. The radiologist sees not the growth but the result of stenosis of the bronchus; when less commonly, the growth invaded the lung, the diagnosis was much more difficult. Two great aids in diagnosis, he said, were production of artificial pneumothorax and injection of lipiodol. In illustration he showed skiagrams on the epidiascope.

Prof. E. C. Dodds (London) said that he and his assistants had worked for three years testing methods for diagnosing malignant disease from a study of the composition and behaviour of the blood. In particular he had investigated the Abderhalden, the Shaw-Mackenzie, and the Ringold methods; all these investigations proved the methods quite unsuitable for the diagnosis of malignant disease.

Dr. K. Itchikawa (Japan) showed a chart illustrating the modifying effects of varying amounts of albumin and globulin in Botelho's serum reaction for early diagnosis of cancer; in certain cases it appeared possible for it to give a positive reaction where no cancer was present.

The Chairman, in closing the discussion, said that in advocating laparotomy, obvious risks must not be forgotten such as mortality from anæsthetics, adhesions, and the bad effects on neurasthenic patients. The physician should therefore have strong grounds on which to base a recommendation for operation. The results of sero-diagnosis were, he thought, disheartening; the most reliable test seemed to be the biopsy test. He referred to the great discordance of opinion as to the frequency of cancer of the stomach in regard to gastric ulcer, and suggested that it was probably more common in America than in other countries; in his experience it was a very rare occurrence. He said that in his opinion the test-meal was of great value in diagnosis, particularly ferment activity and the absence of active hydrochloric acid. He considered that the only hope of cure lay in early diagnosis.

On the same day the Section of Radiology, under the chairmanship of Dr. Robert Knox, discussed the

Effects of Radium and X Rays on Circulatory Systems, with Special Reference to Malignant Growths.

Prof. F. C. Wood (Columbia) said that the effect of radiations, electric currents, and even excessive heat and cold upon the blood-vessels was to cause a thickening of their walls. The vascular changes following exposure to radium and X rays were especially clear-cut, and probably played a part in the therapy of tumours and in the chronicity of ulcers following over-dosage. Twenty-four hours after heavy exposure the intimal endothelium of small arteries and the muscular coat were swollen, and as the process became chronic the œdema disappeared, the endothelium proliferated, and the vessel might be closed. Veins showed only a slight thickening of walls. The importance of this change lay in the reduction of the blood-supply to the part, consequent on the arterial thickening, and this was a factor in the arrest of a tumour. Lymph vessels, at an early stage of irradiation, showed no alteration. Later some dilatation might be observed, but the vessels did not become closed. No therapeutic doses of irradiation were capable of closing lymphatics.

Dr. A. Lacassagne (Paris) asked what part was played in the regression of cancerous tissues by circulatory changes following irradiation, and said he thought it was largely a question of starvation due to restricted blood-supply. As to the lymphatic vessels, knowledge as to what occurred in these following the use of rays lacked precision, though it was clear that in cancer-sterilising doses irradiation might disturb the lymphatic circulation, at least in certain regions of the skin. To kill the cancer cells—a necessary condition for the cure of a malignant neoplasm—it was necessary that the radiant energy should impinge directly on to them. Sclerosis of the dermis, and consequent obliteration of the lymphatic circulation might sometimes retard and localise the growth of certain cutaneous cancers.

Prof. H. **Holfelder** (Frankfort-on-Maine) said it was recognised that in dealing with cancers by radiotherapy the object was to cause the degree of reaction which normal tissues could just tolerate without sustaining permanent damage. An excessive dose of X rays led to a more or less complete obstruction of lymphatic and smaller blood-vessels, especially the capillaries, thus obstructing nutrition to healthy tissue. This must always be avoided. For even a lethal dose of radiation to be effective on cancer, the help of the connective tissue was needed, and this complex intracellular metabolism was conditioned mostly by the blood and lymph flow. There was always an interval after irradiating a growth before any sign of reduction was observable.

Mr. **Clifford Morson**, speaking as a surgeon who practised radiology, said that a large dose of radium caused extravasation of blood, whereas a smaller dose produced obliteration of the blood-vessels, without rupturing their walls. Malignant growth of a blood-vessel (endothelioma) could be destroyed by irradiation. In the treatment of malignant disease by irradiation it was important to remember that the greater the vascularity of the organ in which the tumour was growing, the better the results from such treatment; good examples were growths of tongue and uterus. The cutting off of the blood-supply had three advantages: immediate cessation of the hæmorrhage, deprivation of nourishment to the tumour, and the retention of any substance which exerted secondary radiation.

Dr. **Douglas Webster** spoke of metabolic changes in the blood. He said it was agreed that huge doses of irradiation were needed to damage the cancer cells directly, and it was necessary to take into consideration also the connective tissue stroma of the growth, and the blood and lymphatic distribution.

Prof. H. **Holthusen** (Hamburg) pointed out that as irradiation could alter the sensitiveness of the skin the erythema following deep irradiation was not always a safe indicator as to the dosage being applied.

Dr. F. T. **Burkitt** referred to the direct action on blood produced by pure gamma rays.

Dr. W. **Levitt** spoke of a series of cured cancer cases which he had treated by intensive X ray radiation, in all of which there was, during treatment, a rapid decrease in the lymphocyte count.

The **Chairman** thought that until quite recently the indirect effect of irradiation on tumours had not received adequate attention, but he had now been able to organise research on this aspect, in the hope that guidance for treatment would emerge. Already practical results had been achieved. His own view was that a drop in the lymphocyte count was an indication to go slowly with the irradiation. He was not sure that the profession even yet realised the damage which might be caused by injudicious exposures.

GEOGRAPHICAL AND RACIAL PREVALENCE OF CANCER.

At the Section of Statistics and Public Health the chairman, Lieut.-Colonel F. E. **Fremantle**, M.P., in his opening remarks, emphasised the value of the study of public statistics. They were often extremely suggestive. At the same time it was most important to guard against a wrong use of statistics, for they easily lent themselves to false representation.

Prof. **Major Greenwood** (London) sought to define the problems at issue and give some account of the data needed for their solution. In comparing the mortality of cancer in different races great differences were found, but it had to be decided: first, whether these differences were merely the outcome of better or worse systems of recording; and, secondly, if not, whether they were due to habits of life, climate, and other environmental factors, rather than to differences in racial character. These questions had never been satisfactorily answered.

The majority of those who had studied official vital statistics were satisfied that the mass comparison of national rates of mortality from cancer was at present of little value. However, the comparison made by the Health Organisation of the League of Nations between cancer of the breast and uterus in the female populations of England and Wales, Italy, and the Netherlands showed clearly that death from cancer of these sites was far more common in England, whereas gastro-intestinal cancer was more prevalent in the other countries. No explanation had been found for this. The total mortality from cancer in these countries was about the same.

The fact that this national contrast was specific and not general suggested that its origin was likely to be environmental. For instance, they would expect that kangri cancer would occur with similar frequency in all races who adopted the particular practice which was the exciting cause, although this expectation might be falsified by racial variations in responsiveness. When it was a question of pathological change in sexual organs they might speculate as to whether the explanation might not be in some difference in the sexual practices of the peoples in question, a subject of which little was known. The conclusion drawn was that they had not sufficient data nor sufficiently powerful methods of statistical analysis to solve these problems. With the object of adding to these data he desired to refer briefly to the regional distribution of cancer in England and Wales.

Cancer was regionally less variable than the non-tuberculous respiratory diseases; in fact, its local variability was not great. Unfortunately the existing English data were quite inadequate for the racial characterisation of different parts of the country. If the sharpest contrast from the racial point of view was made which the data permitted—viz., between the Welsh cities and those of the east of England—it was found that for cancer as a whole the two groups gave practically identical rates, although for other causes of death there was a large difference.

The scanty collection of data available served to confirm the impression that the geographical and racial factors of variability were of less importance in cancer than in other great causes of mortality. A point of interest which emerged from the League of Nations' study was that whereas mortality from sites other than uterus or breast was correlated with mortality from non-cancerous conditions, no reliable correlation could be discovered between mortality from cancer of these sites and mortality from non-cancerous conditions. This complicated the problem and was an additional argument for his contention that we needed more facts before we could frame hypotheses.

In the absence of Prof. A. **Niceforo** (Naples) and Prof. E. **Pittard** their communications were summarised by Prof. **Greenwood**.

Prof. **Niceforo** divided Europeans into the following races or anthropological types: *Homo nordicus, H. alpinus, H. mediterraneus, H. orientalis, H. dinaricus.* Italy was peopled by representatives of the types alpinus and dinaricus in the north, alpinus or mediterraneus in the centre, and mediterraneus in the south and islands. He found statistical correlation between the presence of the Mediterranean type of short stature, dark, dolichomorphic cranium, and the lower rate of cancer incidence, while the presence of the brachymorphic alpinus and dinaricus was associated with a higher cancer-rate. But he doubted whether it was race or race alone which influenced the cancer mortality, for in some provinces of northern Italy inhabited by populations of the Mediterranean type the cancer incidence was as high as that of other northern provinces. The author then considered racial types and cancer incidence in other European countries. He could draw no conclusions from the facts available, and was of opinion that the problem was so complicated that even where excellent material was available the statistical method by itself could not suffice. He proposed a new way of studying the question by direct examination of some thousands of cancer patients. It could then be seen whether certain morphological characters were more frequent in cancer patients or not. It would be easier to carry out than the other and might lead to more certain conclusions.

Prof. Eugene Pittard (Geneva) discussed the question of race. In Europe the Nordic race appeared to be most affected by cancer, the Mediterranean race least. He compared the rates of mortality from cancer in Sardinia, Sicily, and Malta. They were respectively 32·4, 41·1, and 48·2. Sicily showed a higher rate than Sardinia because its racial condition was less homogeneous. The rate in Malta was explained by the presence of a colony of Nordic Britons. London had a much higher cancer mortality than New York. New York had a heterogeneous population; London was mainly Nordic.

Dr. M. Sourasky (London) read a paper on the Incidence of Cancer among Jews and the Problem of a Specific Racial Factor in Cancer. In studying cancer among Jews account must be taken not only of the comparative incidence of cancer mortality, but also that of various organs separately. There was no truth whatever in the suggestion that Jews were immune from cancer, nor were they specially prone to it. The speaker showed figures from six European capitals in support of his statement. Speaking generally the variation was geographical, not racial.

But when the incidence of cancer of the various organs was examined it was seen that cancer of the uterus, penis, and buccal cavity was less among Jews, whilst that of the gastro-intestinal tract showed a greater frequency. Cancer of the tongue was about half as frequent in Jews as in the non-Jewish population. This could be accounted for by the lower incidence of syphilis, and therefore of chronic superficial glossitis amongst them. Their immunity to penile cancer was explained by circumcision. A similar immunity was found among the Mohammedan Indians, who practised circumcision, while the Hindoos of the same race who did not were prone to be attacked. The figures for carcinoma of the breast varied, being sometimes lower, sometimes a little higher than those for the rest of the population. In London the mortality from breast cancer among the poorer Jews was decidedly lower (60·9 per cent.) and that of the richer somewhat higher (103·7 per cent.), compared to England and Wales generally (100 per cent.). The explanation here was simply a matter of social status; among the richer Jews were more unmarried women, later marriages, and a lower birth-rate, all of which factors favoured breast cancer.

The remarkably low incidence of uterine cancer (one-third to one-half the number occurring in the rest of the population) appeared to be due to the observance of the Mosaic ritual laws by the mass of Jewish women. Their main provisions were the prohibition of coitus at certain times and the imposition of frequent ritual baths. The practice of this code produced a high degree of sexual cleanliness and restricted cohabitation at times when rest was probably beneficial. Some continental authorities held that while carcinoma of the cervix was a disease of married life pregnancy was not an essential factor. This view was not widely accepted, but it was clear that married life was the usual precursor of cancer of the cervix. A well-regulated sex life might therefore be a favourable factor in the avoidance of disease. In any case, obedience to the Mosaic code resulted in a highly satisfactory sexual hygiene.

With regard to the high mortality among Jews from gastro-intestinal cancer no ætiological factor could at present be brought forward. Racial predisposition had no evidence in its favour. It could only be suggested that the well-known tendency of Jews towards metabolic disturbances should be remembered in this connexion.

Dr. Percy Stocks (London) read a paper on the evidence for a regional distribution of cancer prevalence in England and Wales. He concluded that after correction for sex, age selection, urbanisation, and migrational selection the mean cancer indices of the county areas grouped themselves into definite regions of high and low prevalence, showing that geographical influences were in some way concerned. The large towns showed wide differences which could not be explained by their age or social distributions, and their rates tended to be generally consistent with those in the surrounding country.

Dr. Matthew Young (London) was unable to be present. His studies of cancer mortality and the distribution of racial types in Scotland suggested that if any real association existed it was in inverse ratio to that shown in other parts of Europe, for the greater the proportion of the Nordic type in the population the less the cancer mortality.

Dr. R. M. F. Picken (Cardiff), in discussing Dr. Stocks's paper, pointed out the danger of drawing conclusions when all the factors were not understood. South Wales was racially no more Welsh than the English counties around North Wales. Probably Liverpool and Lancashire had more Welsh stock than the Welsh counties.

Commander Gibbon showed statistics of the incidence of cancer in the Navy and in the native labour force at Singapore. The figures of incidence of gastro-intestinal cancer paralleled closely those of the incidence of disturbances of the digestive system in general.

The second discussion on the same morning centred round

Public Action in Regard to Cancer.

The opening address by Sir George Buchanan (Ministry of Health) will be found elsewhere in this issue.

Prof. J. Maisin (Louvain) considered that the most effective way of prosecuting the campaign of cancer in any country was to provide a number of anticancer stations. The stations should be of two kinds: primary fully equipped stations and secondary stations. Each station should be under the charge of a director, who should be a laboratory man with good clinical knowledge or a physician, because the choice of a surgeon or radiologist might tend to a one-sided view of the scope of research or a consequent suppression of initiative in some directions. The station must be equipped like a large modern hospital and must have first-class specialists in all branches of medicine. Supervision of patients who have undergone treatment must also be provided for and a complete system of records kept up. Research centres were a necessary part of each station. Centres of instruction for young practitioners were absolutely indispensable and courses of instruction in the early diagnosis of cancer should be made compulsory. Lectures, popular instructions, and the distribution of pamphlets should not be neglected, but they were of secondary value and should be used with prudence so as not to provoke carcinophobia. The duty and interest of the public was to assist by every means at their disposal in the realisation of such an undertaking.

Dr. G. A. Soper (New York) described the work of the American Society for the Control of Cancer. This Society had sought to instruct the public concerning cancer by means of pamphlets, posters, lectures, moving pictures, radio, magazine, and newspaper articles, and finally by "cancer weeks." The latter especially appeared to arouse great enthusiasm and led to thousands of people coming up to be examined in the temporary clinics held, many cases of cancer being thereby discovered.

Dr. Stanley P. Reimann (Philadelphia) had made a careful statistical study of the influence of the educational campaign on the interval between discovery and consultation in mammary carcinoma. During the years from 1900 to 1927 inclusive there had been a steady decrease in the time interval between the discovery of carcinoma by the patient and consultation with the physician or surgeon. There had been no inflection in the curve to indicate that the educational campaign begun in 1914 had had any effect. The improvement during the first 14 years when there was no educational propaganda was just as great as during the last 14 years. The speaker liked to think the steady progress was due to better training of physicians.

Sir **John Robertson** (Birmingham) discussed the cancer problem from the point of view of a medical officer of health. In Birmingham cancer mortality was on the increase, especially among males. Fifty years ago the incidence was one male for every two females; now it was one male for every one female. The type of district made no difference. In those who had died of carcinoma of the breast the average time between the patient noticing a lump and applying to a doctor was 10·2 months. He did not advocate compulsory notification because of the difficulty of offering suitable treatment to all cases. The public should be educated as was done for tuberculosis.

Dr. **Veitch Clark** (Manchester) advocated the public control of cancer as the immediate practical way of dealing with the disease. He was not in favour of cancer clinics. Quack treatment of cancer should be made illegal. It was necessary to clear the public mind of misconceptions concerning cancer. He described the work now being done in Manchester.

Mr. **Arthur Cooke** (Cambridge) proposed the establishment of clinics where routine breast examinations of the whole female population could be made once a year. In a population of 100,000 there should be something under 100 cases for discovery annually.

Prof. **Fichera** (Milan) described the Vittorio Emanuele III. Cancer Institute of Milan, opened on May 1st of this year.

Dr. **L. M. McKillop** (Queensland) gave statistics on the incidence of cancer in Australia and described the Queensland Cancer Campaign.

Dr. **Mortloch Brown** called attention to the needs of rural districts. She criticised the use of the term "pre-cancerous."

The **Chairman** said there was one thing he wished to impress upon his audience—the duty of refuting statements made on untenable statistics. In the last few months a campaign had been going on amongst the medical profession that certain forms of food produced cancer. An eminent surgeon was even devoting his life to persuading the public that cancer was due to eating meat. There was nothing whatever in statistics to support this. The statement that cancer of the intestine was unknown in India had been entirely refuted. He commented on Dr. Sourasky's remarkable paper and thought that the Mosaic law could give them points in prevention of cancer. Dr. Reimann's paper showed the failure of flamboyant propaganda and the value of steady educational progress. He himself advocated medical inspection every five years after the age of 40. There was no definite message from this Conference. They could not show much to be done on communal lines at present, but they were going forward. They must look to the laboratory workers, especially to pathology, for help. Meanwhile attention to general hygiene had effect in curtailing the ravages of cancer.

THE CANCER HOSPITAL DINNER.

At the invitation of the medical and surgical staff of the Cancer Hospital, about 120 guests sat down to dinner at the Langham Hotel on Thursday, July 19th, when Mr. W. Ernest Miles, senior surgeon to the hospital, presided over a distinguished and representative international gathering. After the loyal toast Sir Berkeley Moynihan proposed "The Cancer Hospital," describing surgery and research as the two arms of medicine at the present day, full use being made of both at the ideal hospital, of which the Cancer Hospital was a notable example. Mr. Miles. in replying, referred to the inspiration which the late Sir Charles Ryall had been to all his colleagues on the staff. Mr. Miles then proposed "The Overseas Visitors," whose achievements he described as beacon lights along the dark road of cancer research. Surgery, he said, it was now admitted, no longer stood alone in the treatment of cancer; radiology stood alongside it, and the wise surgeon would be an expert radiologist, or the wise radiologist an expert surgeon, if indeed, as would be better, the two did not coöperate. The veteran Prof. J. Rotgans, of Amsterdam, and Dr. J. B. Murphy, of the Rockefeller Institute, New York, replied for the visitors, the latter giving the results of his search into the early documents of the Cancer Hospital, which was, as he had discovered, "founded for the relief of a disease for which science has as yet afforded so little help." He remarked on the courage of calling it frankly a "cancer" hospital (which would be impossible in the United States), thus helping to remove that terrific dread and horror which was so potent a force in aiding the spread of cancer in a community. Sir Charles Gordon-Watson proposed "The Chairman" in a neat little speech. Amongst those present were Prof. R. Bastianelli, Prof. J. Ewing, Prof. C. Regaud, Prof. H. Finsterer, Sir John Bland-Sutton, Sir F. Gowland Hopkins, Sir Thomas Horder, and Sir Richard Garton.

UNITED STATES OF AMERICA.

(From an Occasional Correspondent.)

Rabies in Chicago.

Prof. E. O. Jordan, of the University of Chicago, and Dr. E. E. Irons, dean of Rush Medical College, representing the Chicago Institute of Medicine, have issued a public statement of the growing menace of rabies in that city. During the first five months of this year 561 dogs' heads were found rabid out of 704 examined in the laboratory of the health department. In the same period for 1927 only 11 heads were found positive out of 56 sent for examination. In May of this year there were seven times as many positive diagnoses of canine rabies as in the whole of the year 1926. In the last 12 months 1046 persons known to have been bitten by rabid dogs have been given the Pasteur treatment; this figure, however, does not include an unknown number treated by private physicians. There were no human deaths from rabies from 1919 to August, 1927, in the city, but since that time no less than 19 deaths have been reported. Muzzling is called for and the prompt destruction of all stray unmuzzled animals. One may be sure that if Mayor Thompson had not removed from office the competent commissioners of health whom he found in charge of the department, it would not have been necessary for the Institute of Medicine to issue this urgent warning.

Key Catalogue of Insects.

The fourth of a series of key catalogues on medical zoology recently issued by the United States Public Health Service, is entitled Key Catalogue of Insects of Importance in Public Health.[1] It has been prepared by Prof. C. W. Stiles, of the Public Health Service, and Dr. Albert Hassall, of the Bureau of Animal Industry. Accurate classification and cross-indexing make the index exceedingly valuable to all interested in medical entomology. For example, a dermatologist in search of the caterpillars which cause urticaria looks up this word in the introduction under Dermatology, and finds cross-references to 40 different genera of moths and butterflies, the larval stages of which cause urticaria in man.

Risks of Tourist Camps.

A menace to vacationists in this country is the rapidly growing number of tourists' "camps." These camps vary in their conveniences from a strip of untidy earth on which motorists may put up their tents and cook a picnic meal, to small colonies of comfortably furnished wooden or stucco cottages with numerous modern conveniences at hand, including shower-baths and an electric laundry. Some of the State health departments, as, for example, Indiana, have become awake to the need of inspecting such wayside camps, for insanitary privies and contaminated water-supplies are not at all uncommon among them. The Indiana health department provides a certificate of approval, which is to be displayed prominently, and also undertakes to close camps which are not found satisfactory, or which do not become satisfactory after reasonable notice has been given.

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[1] Hygienic Laboratory Bulletin, No. 150. Surgeon-General U.S.P.H.S., Washington, D.C.

MEDICINE AND THE LAW.

Parents' Responsibility for Operations on Children.

IN his last annual report the medical officer of health for Cumberland dwelt upon recent proceedings against parents who declined to submit their children to operations for the removal of adenoids and tonsils. These cases, under Section 12 of the Children Act, alleging neglect of a child by reason of failure to provide adequate medical or surgical aid, naturally excite controversy, and the local newspapers have published letters in which the action of the parents is stoutly defended. The medical officer, it is said, is merely balancing two remote contingencies. A child is unlikely to die under an operation for removing adenoids: on the other hand, it is unlikely to die or to suffer serious damage if no such operation occurs. Many people, it is argued, live fairly happy and comfortable lives, as life goes in this ill-constructed world, with tonsils and adenoids complete. It is a choice between two remote possibilities—death or serious injury under operation on the one hand, and grave injury to comfort, through throat affections, on the other. Positive certainty of considerable pain and the disagreeable consciousness of mutilation attach to one choice alone. Such are the comments which proceedings under Section 12 evoke. They resemble the comments on other occasions—in connexion with vaccination, for example. There is the same association with strong family feeling, love of liberty, distaste for operations, and dislike of official interference. Parents, fond of a child, naturally resent the allegation of criminal neglect which Section 12 imputes.

While it is impossible to ignore these hostile views, it is too late in the day to put them forward in a court of law. The case of Oakey v. Jackson, in 1914, left no doubt whatever of the parents' duty. A girl of 13 was suffering from adenoids which were causing mental dullness, impaired breathing, deafness, and some anæmia; the only possible remedy was a surgical operation for removal of the adenoids. Failure to permit that remedy was alleged to be causing "unnecessary suffering or injury to health" within Section 12. The father and mother thought an operation unnecessary; they did not believe in operations, and they refused to allow the child to go to the infirmary where the operation could be performed. On their behalf it was argued that the Act never intended to make surgical operation compulsory; the performance of the operation and the administration of the anæsthetic must involve some measure of risk to life; parents were justified in refusing to take the risk, and such refusal was not a failure to provide adequate medical aid. The justices agreed and declined to convict, but the King's Bench Division remitted the case to them for reconsideration. Darling J. quoted the dictum of Lord Russell of Killowen C.J. in Reg. v. Senior: "neglect is the want of reasonable care—that is, the omission of such steps as a reasonable parent would take, such as are usually taken in the ordinary experience of mankind." Applying that opinion to Jackson's case, Darling J., with an unusual disregard for the canons of judicial ignorance, remarked that it was not necessary to know much about surgery to know that the operation for the removal of adenoids was very common in the case of children, and that a failure to perform the operation might result in danger to life if the child should ever happen to be attacked with illness. The parent, he continued, was under a legal liability to allow the operation if the refusal to do so was in the circumstances a failure to provide adequate medical aid. It was a question of fact in each case, and the justices might very properly have convicted Jackson. The justices, it appears, cannot evade the responsibility of dealing with the facts. In a case reported in the *Times* of May 21st, 1912, the justices convicted a father, under Section 12, of neglect to provide medical aid in the form of an operation for cleft palate. The High Court then refused to make absolute a rule *nisi* for *certiorari*, the question being simply one of fact for the justices. The latter have to consider the nature of the operation and the reasonableness of the refusal. It is all very well to argue that there is merely a choice between two remote contingencies, and that the parents, rather than the medical officer, should have the right to choose. The material for the decision must mainly be a matter of medical evidence. One thing to be taken into consideration by the justices, said Avory J. in Oakey v. Jackson, is whether the person who advises the operation is a qualified medical practitioner or merely some irresponsible person.

So stands the law, and arguments and comments must not ignore the law. In the last resort, of course, a parent might say, "I do not recognise the law and, sooner than allow an operation upon my child, I will go to prison." Conscientious objection may be a rule of conduct; it is not a legal defence. Before the Children Act was passed in 1908, there was an earlier statute containing something akin to Section 12. Under this earlier Act Robert Downes was prosecuted in 1875. His child had been wasting for some nine months from chronic inflammation of the lungs, and then died. The father belonged to a sect which never called in medical advice but called in the elders of their church to pray over sick persons. The Court held that, whatever doubts might exist as to a duty at common law to provide adequate medical aid, the statute left no doubt whatever. The statute, said Baron Bramwell, imposed an absolute duty upon parents, whatever their conscientious scruples might be: "the prisoner wilfully (not maliciously, but intentionally) disobeyed the law and the death ensued in consequence." Those who disagree to-day with the positive duty imposed upon parents by Section 12 of the Children Act are perfectly entitled to demand that the law be changed. It is doubtful if such an agitation will commend itself to an electorate to which a large feminine contingent has lately been added. Meanwhile, medical officers of health are equally entitled to draw attention to the existing law, and, in this respect as in others, to seek to educate the public in all health matters.

DONATIONS AND BEQUESTS.—Mr. Walter Kerr Fernie, of Thornton Hough, Cheshire, and of Liverpool, besides other bequests, left £1000 to the executors for such charitable institutions or objects and in such proportions as they may think fit, and £500 each to the Liverpool Royal Infirmary; the David Lewis Northern Hospital, Liverpool; the Royal Southern Hospital, Liverpool; the Stanley Hospital, Liverpool; the Royal Liverpool Hospital for Children; and the Neston Cottage Hospital.—Miss Mary Turnbull, of Nottingham, left £1000 to Nottingham General Hospital for the purposes of the superannuation fund connected therewith.—Mrs. Elizabeth Jane Reddaway, of Southport, among other bequests, left £500 each to St. Mary's Hospital for Women and Children, Manchester, to Henshaws Institute for the Blind, to the Northern Counties Hospital for Incurables, to the Hospital for Consumption and Diseases of the Chest, Manchester, to the Children's Hospital, Manchester, to the Christie Hospital, Chorlton-on-Medlock, to the Babies' Hospital, Slade-lane, Manchester, to the Manchester and Salford-street Children's Mission, and to St. Dunstan's Hostel.—Mr. Edward Masfen Arrowsmith, of Sydenham-park, left £500 to the Home and Infirmary for Sick Children, Lower Sydenham, S.E., and £500 to the Metropolitan Convalescent Institution (Seaside Branch).—Mr. Arthur Tyler, Oadby, Leicester, left £500 to the Leicester Royal Infirmary, £250 to the Leicester Guild of the Crippled Holiday Home, and £200 to the Leicester and Rutland Institution for the Blind.—Mrs. Elizabeth Wilson, North Shields, bequeathed £16,500 to the Tynemouth Jubilee Infirmary for additional buildings.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT CARDIFF.

REPRESENTATIVE MEETING: JULY 20TH-23RD.

THE annual Representative Meeting of the British Medical Association opened at the City Hall, Cardiff, on Friday, July 20th, with Dr. C. O. **HAWTHORNE** in the chair. The representatives were officially welcomed by the Lord Mayor.

Mr. A. H. Burgess, professor of clinical surgery in the Victoria University of Manchester, was elected President of the Association for 1929–30, and Dr. W. Harvey Smith, of Winnipeg, for 1930–31. Mr. R. G. Hogarth and Sir Robert Bolam were appointed Vice-Presidents, in recognition of their services as President and Chairman of Council respectively.

International Obligations.

Much discussion arose on a proposal that the B.M.A. should become a full member of the Association Professionelle Internationale des Médecins (A.P.I.M.), whose object it is to be an international union and bureau for the interchange of information and ideas on the social and political aspects of medical practice. The proposal had been rejected by the Council on the ground that membership would bring to the B.M.A. no advantages which would justify the annual subscription (£125) and the demands which would be made on the time of the medical secretary and his staff. The Council expressed its willingness at all times to furnish medical associations, national or international, with any information at its disposal, and several representatives said they thought this was sufficient evidence of the desire to help the profession in other countries. They pointed out that lack of funds already hampered expansion of the B.M.A.'s own work at home and that the expense of belonging to the A.P.I.M. might eventually reach £1000 a year, representing a very large capital sum. Medico-political problems, unlike those of science, were purely national, and must be settled nationally. The A.P.I.M. was young and had no prestige; to join at this stage would be a step in the dark. In answer to these objections it was argued that the purpose of joining might be to give rather than to receive. The new association could not thrive unless it was supported, and the B.M.A. had experience which would be really useful abroad. Membership of the A.P.I.M. involved no obligation to abide by decisions taken on the continent, nor did it commit the B.M.A. to expenditure beyond the subscription. The great need of the world was for international coöperation, and in point of fact there was much to be learnt from the ways in which other countries dealt with such problems as health insurance and the certification of the insane.

These last arguments carried the day, and the meeting instructed the Council to take the steps necessary to secure full membership of the A.P.I.M.

Radiotherapy by the Unqualified.

Mr. H. S. **SOUTTAR**, Chairman of the Science Committee, proposed:—

> That the Representative Body express the following opinion, namely, that in view of the risks to the public involved in the use of electricity and radiation as methods of treatment by untrained and unqualified persons it is to be desired (1) that suitable courses of training should be organised under medical direction for persons who wish to administer this form of treatment; (2) that persons who have satisfactorily followed such a course should be entitled to have their names entered on an approved roll; (3) that one of the conditions attached to admission to, and maintenance on, the approved roll should be abstention from the treatment of any patient except upon the responsibility and under the general supervision of a registered medical practitioner; and (4) that patients who require electrical or radiation treatment should be referred only to those persons whose names are on the approved roll.

He put forward the motion because it was undesirable that the public should be misled by the absurdly optimistic claims made by institutions providing treatment by ultra-violet rays and electricity. On the other hand, medical men wanted to be able to send their patients to places where suitable treatment of this kind could be skilfully given.

Dr. J. F. **WALKER** thought it unwise that the Association should set the seal of approval on any kind of unqualified practice. Could the line be drawn at chiropodists or herbalists?—Dr. H. B. **BRACKENBURY**, Chairman of Council, answered that there could be no objection to the establishment of a register containing the names of persons competent to do certain things, so long as they were prepared to do these things only under the supervision and direction of registered practitioners. The Association would never have opposed the registration of opticians had they not asserted the right to act as independent practitioners. The profession had to recognise at this time of day that there were craftsmen capable of doing things that medical men were not prepared to do for themselves.

The motion was carried by a large majority.

Proprietary Medicines and Secret Remedies.

The meeting approved a motion by Lancashire and Cheshire that the Council should "consider the advisability of resuming the investigation into the composition of secret remedies and the publication of the results." It was pointed out that a very large number of patients were misled by specious advertisements in the daily press, and that there was a constant stream of inquiries from doctors concerning the value of the preparations recommended. The Chairman of Council said that the matter had lately been considered, and it was thought that the cost might be prohibitive. The old publications could hardly be re-issued in their present form, but if they were revised it must be done ab initio.

The meeting was more impressed, however, by Dr. J. **D'EWART**'s reminder that the expense of publication. and even of actions at law, might easily be justified by what the Association would gain in the public esteem by work so obviously useful.

The New National Health Insurance Act.

Dr. H. G. **DAIN**, Chairman of the Insurance Acts Committee, said that the Minister of Health had informed the profession that there was little in the Insurance Bill that concerned their interests, but the few words affecting them had proved to be very important. The Act of 1924 had said that additional benefits should be administered by approved societies unless they were "in the nature of medical benefits." This clause was omitted from the new Act, and at the same time new additional benefits had been introduced. He proposed the following resolution:—

> That it is essential if the medical profession is to take part in the provision of additional (medical) treatment benefits under the National Health Insurance Acts that these, as in the case of statutory medical benefit, shall be administered in such fashion that the services of the medical profession, who elect to give advice and treatment in connexion therewith, shall not be under the control of any approved society or societies.

This was passed nem. con., and it was agreed that the principle ought to receive statutory recognition and definition.

Dr. **BRACKENBURY** said that the new Act gave the approved societies dangerously wider powers, but these could only be exercised with the Ministry of Health's approval. The profession preferred protection by legislation to protection by consultation. The new Act recognised two forms of additional benefit which had been separated by an unfortunate accident. The first was payment to a practitioner for treatment or advice outside the scope of any other additional benefit or of medical benefit, under a special scheme approved by the Minister for the purpose. The second was payment to approved charitable institutions (e.g., clinics) for similar forms of treatment. By law an approved society could adopt the second of these without adopting the first and thus the position of ecialists or consultants would obviously be preidiced. The Minister had promised to do the tmost in his power to dissuade an approved society om taking such action, but if societies proved efractory a situation might arise in which the ssociation would have to advise consultants and pecialists to take no part in a particular schemes.

Dr. E. R. FOTHERGILL (Brighton) expressed grave ears that specialists and consultants would lose ractice because the approved societies would tend o make arrangements with hospitals and institutions, nd after discussion the meeting unanimously ccepted his resolution instructing the Council to press n the Ministry "the necessity for the adoption or pproval of such regulations and schemes only as are n conformity with the appropriate fundamental principles," and to take such steps as may become necessary to unite the profession against accepting service under any other conditions.

Periodical Examination of Insured Persons.

Dr. ELIZABETH CASSON, for Windsor, drew attention to the value of regular medical examinations. The present race of adolescents, who had been inspected throughout their school lives, were, she said, far healthier than their predecessors, or than their contemporaries from places where such examination was not done. A discussion followed in which one speaker pointed out that regular *examination*—even without fee—would profit panel practitioners by keeping their patients away.

Mr. E. B. TURNER wished that approved societies could be induced to look at things in terms of health and efficiency instead of £. *s*. *d*., and the tendency of some representatives to discuss the financial aspect was discouraged by others who wished the meeting to express a general opinion for the information of the public. The following motion was carried by a large majority :—

> That in the opinion of the Representative Body the establishment of periodical medical and dental examination of all persons insured under the National Health Insurance Acts is urgently called for as an economic proposition, having regard to the return so to be obtained in health and productive efficiency; that every such insured person, when accepted as a patient on a doctor's panel, should be by that doctor medically examined and the result of that examination placed on record; that preliminary examination should apply also to dental examination, when that additional benefit is included and available under the National Health Insurance Acts.

Assistant Medical Officers in Mental Hospitals.

Dr. J. W. BONE, chairman of the Medico-Political Committee, brought forward recommendations on the payment of assistant medical officers in mental hospitals, as set out in the Council's report. These, he said, represented an attempt to bring the 1915 scale up to date, and were submitted for general approval. The report received a good deal of criticism, especially from Dr. PETER MACDONALD, who said that the proposals had not been discussed with the Royal Medico-Psychological Association, and might have an unfortunate effect on the present relations between the governing bodies of mental hospitals and their medical staffs. They would be taken as interference by an outside organisation and if they were applied might have the effect of levelling down salaries rather than levelling them up.

These views gained some support, but the Council succeeded in getting the general approval it asked for the proposals, on the understanding that the recommendations did not become part of the policy of the Association until there had been further negotiations with the bodies concerned.

Paying Centres for Infant Hygiene.

Dr. BONE reported that a deputation had waited upon the Council from the Association of Infant Welfare and Maternity Centres, and the Babies Club at Chelsea. The deputation said that there was a strong feeling that the mothers of the middle-class public should be able to get that guidance and instruction which is provided by the municipal and child welfare clinics for poorer mothers. Many private practitioners, it was considered, were unable or unwilling to give the kind of instruction required, and there were advantages in having the instruction given at a centre by a doctor who had given special attention to this branch of medical work, assisted by a fully trained nurse. The Council believed, said Dr. Bone, that the ideal was that mothers should be able to look with confidence to their own family doctor for the guidance required, but he thought it was no use to say that there ought to be no such centres as the one proposed. They already existed, and they would be set up in increasing numbers. The Council had been asked to say what were the right lines for their conduct and therefore put forward a resolution saying that the education of mothers was desirable, that there were already means by which it could be partially attained, that the further establishment of paying centres should be for the purpose of education and health propaganda and not for treatment, and that mothers preferring to avail themselves of the centres should do so with the knowledge of the family medical attendant.

The Council made several other recommendations on the subject, but opposition from representatives prevented their being considered.—Dr. FOTHERGILL and Mr. E. B. TURNER attacked the principle of countenancing clinics for people who could afford to have a doctor of their own.—Dr. J. W. JOHNSON said that young mothers were more and more seeking the aid of practitioners concerning the upbringing of children, and there was no excuse for lending aid to a misguided scheme of this kind.—Dr. E. A. STARLING deplored the extension of the "wave of clinics" from the poorer classes to the richer.—Dr. JOHN STEVENS thought that such a scheme must lead to overlapping and friction between clinics and practitioners, and Dr. A. B. MURRAY said that "if we're not fit to look after the children it's an end to private practice."

The Council's policy was supported by Mr. BISHOP HARMAN, Dr. DAIN, and Dr. BRACKENBURY.—Dr. CHRISTINE MURRELL suggested that not very long ago the proposal to establish infant welfare clinics for the poor had been looked at askance by the Representative Body; was there not a danger of opposing anything new, because it was new?

Dr. L. W. BATTEN spoke convincingly on the demerits of work at clinics, of which he claimed experience, and amid enthusiasm the meeting passed the following resolution, which represented the view of the Council in 1917 :—

> That while it fully appreciates the value of any educational work proposed to be undertaken at paying centres for middle-class mothers in the way of giving lectures on infant management, it does not approve of these centres providing consultations and advice in respect of mothers and young children belonging to classes of the community who are quite able to consult their own family doctor.

Maternal Mortality and Morbidity.

On a report brought forward by Sir EWEN MACLEAN, as chairman of a special committee, Dr. DAIN said he was specially impressed by the fact that better organisation would bring about a big reduction of puerperal mortality and morbidity. The report showed that three-quarters of the mortality could be done away with by measures of organisation alone, and the success being attained by certain workers in the slums of large cities ought to be available for the ordinary woman. The same view was reflected in speeches by Dr. JAMES YOUNG (Edinburgh) and Dr. R. C. BUIST (Dundee) who proposed that the Council's recommendations should be amended to include a resolution—preceding the others because of its importance—"that such immediate steps be taken as will ensure full and cordial coöperation between doctor and midwife." This was approved by the meeting, in conjunction with the following recommendations contained in the report :—

> (2) That steps should be taken to determine by further experimental research: (*a*) The factors which constitute and the conditions which vary resistance to disease, particu-

larly as regards pregnancy and the puerperium. (*b*) The best specific prophylactic measure to employ for the prevention of infection by *Streptococcus pyogenes*. (*c*) The length of time required to acquire such immunity and the degree and duration of such immunity. (*d*) The therapeutic value of specific as opposed to antiseptic measures in the treatment of *septicæmia caused by Streptococcus pyogenes.*

(3) That increased facilities should be provided for training medical students with special reference to antenatal work.

(4) That a condition of the payment of maternity benefit under the National Health Insurance Acts should be that the mother has had at least one antenatal examination by a qualified medical practitioner during her pregnancy.

(5) That members of the medical profesion should be encouraged to keep regular and careful records of their midwifery cases.

(6) That there is need for further provision of beds specially set aside for maternity cases in institutions. That every maternity home should provide for the complete isolation of septic cases.

(7) That the Association should consider the allocation of additional grants to promote research into the problems raised in this report, including especially the questions raised in the first recommendation of this report.

(8) That a Committee with adequate representation of practitioners be set up to formulate measures designed to bring about reduction in puerperal morbidity and mortality rates, to keep in touch with research work, and to assist divisions and branches of the Association in arranging for education and propaganda with regard to the value of antenatal service, the method of dealing with confinements, and the post-partum care of the mother and care of the infant.

Dr. BRACKENBURY, as a Direct Representative on the General Medical Council, said that the Council had been investigating allegations about the inadequate training of medical students in midwifery. The replies received from teaching institutions had almost all been satisfactory. and neither the public nor the profession need be under any anxiety. All medical students were having full opportunity for training in this sphere and were liable to a complete examination. There was no excuse for saying that the registered practitioner passing through the present régime was not fully trained for undertaking antenatal work, and there was no case for taking the matter out of the hands of the private practitioner.

In the consideration of this subject a certain amount of discussion arose between representatives who thought that the ideal midwifery service consisted of midwives assisted by specialists, and those who regarded the general practitioner as the proper person for the conduct of labour.

Payment for Ambulance Lectures.

Dr. PETER MACDONALD explained that at York the profession tried to carry out the B.M.A.'s policy that ambulance work is a matter of business and not of philanthropy. They had found, however, that elsewhere in the country medical men gave their services for nothing or for an honorarium. This was confirmed by other representatives who told of " blacklegging " by doctors. It was impossible, they said, to get the fee of one guinea for each lecture—a legitimate fee in view of the trouble involved in keeping up with the handbooks—so long as medical men were willing to accept presentation walking-sticks or railway vouchers instead of their rights. Dr. MILNER MOORE, who confessed, at the age of 88, that he had never previously addressed the Representative Body, strongly urged that the Association's policy should be maintained and observed, and this proved to be the opinion of the meeting as a whole.

Compulsion in the Treatment of Venereal Disease.

Dr. DAVID LEES, for Edinburgh and Leith, proposed a motion stating that it was essential that further power should be given to practitioners and local authorities " with a view to strengthening the voluntary system by placing a ' compulsitor ' on all persons infected with venereal disease in order to secure the submission to treatment and continuance under treatment of such persons until discharged by a registered medical practitioner." In England, he said, 63 per cent. of the known cases of venereal disease failed to complete their treatment; in Wales the percentage was 45 and in Scotland 51. In face of this could anyone say that the present schemes were successful? Few clinicians would say that we were stamping out syphilis; none would say that we were lessening gonorrhœa. The reasons were two—ignorance and carelessness. It was the duty of the profession to dispel ignorance and the duty of the State to discourage carelessness. The plan of a compulsitor as approved by every local authority and medical officer of health in Scotland did not infringe the liberty of any subject who deserved liberty. It only infringed the liberty of the libertine.

Mr. BISHOP HARMAN thought that compulsion would drive the disease underground where it would be even more destructive than at present, but Mr. E. B. TURNER, who said he had spent a large part of his life in the fight against venereal disease, having addressed 987,000 people on the subject, commended the trial of a compulsitor in selected districts, as proposed by Edinburgh, and recommended in the Trevethin Report. Dr. GRAHAM LITTLE, M.P., on the other hand, thought it useless to try compulsion locally. People would change their place of residence, and in any case defaulting was the least important of the problems of syphilis. The wholly untreated patient was the real danger to the community, not the patient whose infectivity had been reduced by beginning a course of treatment. Dr. BRACKENBURY also maintained that venereal disease could not possibly be dealt with by local option; he would rather see compulsion over the whole country than in limited areas, but Dr. LEES explained in his reply that the area covered by the Edinburgh scheme extended almost from the Forth to the Border, which made a change of dwelling, especially in this time of housing shortage, an impossibility for most patients. The percentage of defaulters at his own clinic was only 26—the lowest in Scotland and perhaps the lowest in the country as a whole. The Representative Body, by passing the resolution, would set a very necessary example to Parliament, some of whose medical Members had ideas on venereal disease some 20-30 years out of date.

The motion was lost by a considerable majority.

Miscellaneous Topics.

An unsuccessful proposal by South-West Wales that the Council should try to secure for the profession a supply of petrol (or its homologues) at commercial rates led to the statement that many garages are willing to make this arrangement with practitioners. Sir RICHARD LUCE said that medical M.P.'s had decided that it would be undesirable to ask for privileges for the profession as regards the new petrol tax.

The Representative Body decided—

> " That it is undesirable that chiropodists should be recognised in a special register as such register would convey to the public that chiropodists were competent to undertake the diagnosis and treatment of diseases of the feet."

A suggestion was put forward that the annual representative meeting should in future be held in London, to deal with medico-political questions so that the business of the annual meeting held at various centres could be restricted to scientific and social work and enlarged in scope. But the motion inviting the Council to consider this plan was lost by a large majority. The same fate met proposals to reduce the annual subscription to two guineas, and to investigate the possibility of establishing a compulsory scheme of life insurance for all members of the Association.

A further account of the deliberations of the Representative Body will be published in a coming issue of THE LANCET. In the course of the proceedings it was announced that Dr. Hawthorne had been re-elected chairman for the coming year and that Dr. Arnold Lyndon had been elected deputy chairman.

QUEEN ALEXANDRA MEMORIAL.—It is announced by the Queen Alexandra National Memorial Committee that, when the fund was closed at the end of June, the total amount received exceeded £233,000.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

CITY OF GLASGOW.

THE discrepancy between the local estimate of the population and that of the Registrar-General is now considerable, and some of the statistics for 1927, from both points of view, are here given.

City of Glasgow (population mid-year).	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Local estimate.. (1,130,675)	20·9	13·7	1·14	1·33	2·5	1·6	107/36	14·4	6·6
R.-G.'s estimate. (1,049,000)	22·4	14·6	1·23	1·43	2·7	1·8	107/36	14·4	6·9

Dr. A. S. M. Macgregor's report, a volume of 381 pages, besides an account of the work of his department and the usual statistical tables, contains special sections dealing with overcrowding, the rehousing for tenants under slum-clearance schemes, the incidence of cancer, results of artificial light treatment in tuberculosis and rickets, a study of puerperal fever at Belvedere Hospital; and an inquiry into the incidence of the non-pulmonary forms of tuberculosis.

Pneumonia and Tuberculosis.

The attempt to provide hospital accommodation for pneumonia, measles, and whooping-cough was made difficult by an unusually high incidence of diphtheria, but the difficulty was relieved by the prompt coöperation of the poor-law authority in admitting patients suffering from pneumonia at times of pressure. Since the municipal hospitals opened their wards to pneumonia, there has been an increased demand and the general hospitals have apparently restricted admission of such patients.

The cases of pneumonia notified during the year numbered 6252 and the percentage admitted to municipal hospitals was 58. Pneumonia, says Dr. Macgregor, is very apt to be erroneously notified and has become a somewhat loose and ill-defined term. In the case of secondary pneumonias the primary cause is often omitted from the death certificate, and this makes it difficult to study the causes which lead to so high a prevalence of respiratory disease in young children. A considerable number of children are sent to hospital for pneumonia who are found to be suffering only from slight catarrh and thus occupy hospital beds to the exclusion of more urgent cases. As an example of the severity of acute primary pneumonia, a case mortality-rate of 26·3 per cent. is cited for 5334 children under 5 years of age, admitted to hospital during the last seven years; under 1 year the case mortality-rate reaches 40 per cent. The death-rate from all forms of pneumonia appears to have increased during the last 70 years, and recent studies suggest that overcrowding and poverty have a greater influence on this death-rate than meteorological conditions.

The death-rate from pulmonary tuberculosis has declined steadily from 1·43 in 1913 to 0·86 and 0·84 in 1926 and 1927. At the request of the Scottish Board of Health treatment with Ruppel's serum was investigated, but the serum did not fulfil expectations. There has been a great fall in the mortality from non-pulmonary tuberculosis.

Since the quinquennium 1901–05, the rate from tuberculous meningitis has fallen from 319 per 1,000,000 to 142; that from abdominal tuberculosis from 301 to 60, and that from other forms of non-pulmonary tuberculosis from 258 to 99. Tuberculous disease of bones rarely leads to amyloid disease nowadays. During May the 4567 cases of non-pulmonary tuberculosis on the register were reduced to 2811 by writing off: (1) those not suffering from tuberculosis; (2) those who had had no active disease for two years; and (3) those of whom there had been no information for two or more years. The residue included 200 under 5 years, 1311 from 5 to 15 years, and 43 over the age of 15. Of the total of 2811 43·3 per cent. suffered from tubercle of bones and joints, 25·5 per cent. from the glandular and 18·2 from the abdominal type. A further analysis showed that tubercle of bones and joints constitutes over 40 per cent. of the cases at the three age-periods mentioned, while the percentage of abdominal tubercle was 35·5 per cent. under 5 years, 23·6 from 5 to 15, and 8·1 over 15, and the glandular form constituted 14·4 per cent. of the cases under 5, 25·8 of the cases under 15, and 28·1 of the cases over 15.

The bone and joint cases are those which require prolonged institutional provision. Of 438 bone cases, 241 suffered from spinal disease. Of the 450 joint cases 205 suffered from hip disease and 127 from knee disease. The figures as regards abdominal tuberculosis are given with some reserve owing to doubt as to the diagnosis.

Owing to housing conditions, institutional treatment is often required until the patient is cured. Thus, of the groups of 2811 patients just analysed, 20 per cent. lived in 1-apartment, 62 per cent. in 2-apartment, 13 per cent. in 3-apartment, and 4 per cent. in 4-apartment houses, and upwards. In 1 per cent. there was no information.

The conclusions of Dr. T. McGowan, from the treatment of tuberculous children with ultra-violet rays at Ruchill Hospital are that the rays have a stimulating effect on all children, but that the reaction in tuberculous cases is greater, and takes the form of an auto-inoculation. Immediately after treatment there is a slight fall in weight and a marked and sustained increase in pulse-rate. The auto-inoculation is proportional to the dosage, and so long as it is not excessive produces beneficial results.

Other Infections.

Influenza was less fatal than in 1926; the mortality from scarlet fever was less; and diphtheria, in spite of increased prevalence, caused a lower death-rate.

A milk-borne outbreak of paratyphoid fever of a mild type gave rise to 67 known cases in August and September, and caused two deaths of young children already debilitated by measles. A follow-up of the 517 survivors from attacks of encephalitis lethargica shows that 245 are fit for work or school, although 104 show minor sequelæ; that 47 are unfit for school; and that 225 are unfit for work, of whom 160 are of the Parkinsonian type, 35 are mental hospital cases, and 30 show other effects. The three years' period for the notification of whooping-cough expired on July 10th, and the notification was not renewed, but visitation by nurses is being continued.

Antenatal Supervision.

During 1927 919 cases were admitted to antenatal wards of the Royal Maternity Hospital as compared with 866 in the previous year. The antenatal dispensary of this hospital was attended by 4267 expectant mothers, and the ten other antenatal centres by 2068. The total births numbered 23,578. Nearly half the expectant mothers attended before the seventh month of pregnancy.

Venereal Diseases.

Among the 47 gonococcal cases of ophthalmia neonatorum there was no damage to eyesight, and among the 358 non-gonococcal cases there was one case of impaired vision of one eye. A plan is given of the new clinic for venereal diseases, opened in October at Black-street, which has relieved the pressure on the Broomielaw dispensary. A table shows that 50 per cent. of the men under treatment for venereal disease and 10 per cent. of the women ceased to attend before completing a course of treatment, and that 3·6 per cent. of the men and 17·5 per cent. of the women failed to submit to the final tests after the completion of the course. Meetings have been held of the local authorities in the West of Scotland and, on March 22nd, 1928, the terms of a Bill for dealing with defaulters was approved at a final conference.

Housing.

The new houses completed during 1927 numbered 5183, compared with 6796 for the previous year, both figures being a considerable advance on former years. For many years it has been impossible to put in operation the statutory powers for the prevention of overcrowding in the 18,000 "ticketed" houses. The most that can be done is to prevent gross overcrowding of one house by two families. The overcrowding in the "ticketed" houses is round about 15 per cent., and when this figure falls it will be an indication that the housing shortage is being overtaken. The crux of the housing problem is the provision of houses at a rental which the working classes can afford. A provisional order is to be obtained for the better supervision of the rehoused tenants. Reports of various rehousing schemes show that about 10 per cent. of the tenants are dirty in spite of repeated warnings. It has been found, by experience, that a considerable improvement can be effected through systematic and sympathetic supervision by nurse-inspectors, and it is proposed to extend this scheme of visitation. During the last five years four slum-clearance schemes have been initiated, involving 5110 houses. Of the latter, 2068 have been demolished, 287 are closed, and 2755 are still occupied. An attempt is being made by power obtained under a local act to control and limit the excessive rentals charged for furnished houses let in tenements.

Bacteriological and Analytical Work.

From the report of the city bacteriologist, Dr. R. M. Buchanan, we learn that 42 cheap shaving-brushes were examined for anthrax with negative results, but that some of the goat-skin thongs used as binding for orange-boxes have given positive results. Of 202 milk samples examined for tubercle two were positive. Dr. Buchanan is of opinion that the tubercle bacillus cannot be satisfactorily identified by the microscopical test, but that animal inoculation is necessary for its detection. During the year 27 milks showed acid-fast bacilli, some of which were indistinguishable microscopically from the tubercle bacillus, and all of which were proved by inoculation to be non-pathogenic. Of 205 samples of designated milk, 189 reached the standard and 16 failed. In certain pasteurised milks, non-sporing cocco-bacilli, or streptococci, have been found, the growth of which appears to have been favoured by the high temperature of pasteurisation. A considerable amount of work has been done with regard to fungoid diseases of fruit, illustrations of which are given in the report. A small outbreak of irritant poisoning, apparently due to eating tinned apricots, appears to indicate that contamination with tin varies according to the quality of the tinplate and the time which has elapsed since canning. The Scottish Board of Health, however, has not felt justified in issuing regulations requiring the date of canning of foodstuffs to be recorded on the container.

The regulations with regard to preservatives in food are said to be working fairly satisfactorily, but butchers in the habit of using a chemical substance known locally as "Madame Rachel" to maintain the bloom of mince have proved somewhat recalcitrant.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 14TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 177 (last week, 182); scarlet fever, 1695; diphtheria, 919; enteric fever, 38; pneumonia, 747; puerperal fever, 33; puerperal pyrexia, 109; cerebro-spinal fever, 7; acute poliomyelitis, 12; acute polio-encephalitis, 1; encephalitis lethargica, 15; dysentery, 7; ophthalmia neonatorum, 106. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified from the following 21 counties:—London, 3; Bedford, 2; Buckingham, 1; Derby, 16; Devon, 1; Dorset, 1; Durham, 39; Lancaster, 6; Leicester, 4; Northampton, 3; Northumberland, 10; Nottingham, 6; Soke of Peterborough, 2; Stafford, 11; Surrey, 1; Warwick, 1: Yorks, East Riding, 20 (Kingston-upon-Hull); North Riding, 3; West Riding, 30; Glamorgan 9; Monmouth, 8.

The number of patients in the Infectious Hospitals of the Metropolitan Asylums Board on July 17th–18th was as follows:—Small-pox, 27 under treatment; scarlet fever, 1759; diphtheria, 1856; enteric fever, 17; measles, 418; whooping-cough, 172; puerperal fever, 22 (plus 18 babies); encephalitis lethargica, 66; poliomyelitis, 1; "other diseases," 27. At St. Margaret's Hospital there were 23 babies (plus 16 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 27 (3) from measles, 6 (0) from scarlet fever, 29 (7) from whooping-cough, 25 (4) from diphtheria, 40 (10) from diarrhœa and enteritis under two years, and 24 (5) from influenza. The figures in parentheses are those for London itself.

The two fatal cases of enteric fever were reported from Bath and Worcester. Of the 24 fatal cases of measles outside London 9 were reported from Liverpool and 3 from Burnley. Of the 22 fatal cases of whooping-cough outside London 4 each were reported from Birmingham and Liverpool, 3 from Manchester. In the same week Glasgow reported 10. Fewer deaths from diarrhœa are reported this week than in the two last.

The number of stillbirths registered during the week was 297 in the great towns (corresponding to a rate of 42 per 1000 births), including 52 in London.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

IT is officially announced that the title of the Director-General of the Medical Department of the Navy has been altered to "Medical Director-General of the Navy."

To be Surg. Lts.: F. Dolan and F. G. V. Scovell.

The following are notified: Surg. Lt. A. R. Ewart to *Columbine*. Surg. Lt. (short service) J. J. Keevil transferred to permanent list. Surg. Lts. (D) T. Hunt to *Vivid* for R.N. Barracks, Devonport; and S. E. Brown to *Defiance*.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. R. B. Ainsworth is apptd. a Professor at the R.A. Med. Coll., vice Lt.-Col. (Bt. Col.) P. H. Henderson, vacated.

To be Bt. Lt.-Col.: Maj. E. T. Potts.

To be Bt. Col.: E. A. Walker, I.M.S.

To be Bt. Maj.: Capt. T. M. Layng, 3/9th Jat. R.

Temp. Lt. M. Clayton-Mitchell relinquishes his commn. and resumes the rank of Capt.

ARMY DENTAL CORPS.

Lt. C. E. Day to be Capt.

SUPPLEMENTARY RESERVE OF OFFICERS.

A. N. T. Meneces to be Lt.

TERRITORIAL ARMY.

Maj. G. F. R. Smith to be Lt.-Col. and to commd. the 164th (W. Lan.) Fd. Amb.

Maj. W. L. R. Wood resigns his commn.

Capt. T. D. Overend resigns his commn.

Capt. C. B. Jones to be Maj.

Lts. R. K. Wilson (R.A.M.C. Res. of Off.) and H. A. C. Gregory (late R.A.M.C., Spec. Res.) to be Lts.

J. G. Weston and H. A. Bulman to be Lts.

ROYAL AIR FORCE.

The undermentioned Flying Officers are promoted to the rank of Flight Lt.: J. O. Priestley and J. Twohill.

RESERVE OF AIR FORCE OFFICERS.

Flight Lts. relinquishing their commissions on completion of service: T. A. G. Hudson and C. H. B. Thompson.

INDIAN MEDICAL SERVICE.

Capts. P. A. Dargan, C. Mac D. Nicol, and L. Blake to be Majs.

Lt.-Col. E. W. Browne retires.

Correspondence.

"Audi alteram partem."

CARDIAC CLINICS.

To the Editor of THE LANCET.

SIR,—Considerable difference of opinion has been expressed recently in your columns as to the predisposing factors in rheumatism. Dr. Reginald Miller thinks[1] that "the environmental factors at work (of which damp and cold are the most important) must to some extent centre round the production of disease-infected tonsils." Dr. W. C. Vining writes:[2] "In Leeds I found nothing to support the belief that damp plays an important part in arousing the rheumatic infection to activity." He does not believe that infected tonsils are an important factor, but regards the effect of diet as paramount. The only way of deciding between them is to obtain and compare figures collected from all the main centres of population in the British Isles.

Last year I was fortunate enough to be closely associated with the formation of a children's cardiac clinic at the Johns Hopkins Hospital, Baltimore. Preparatory to this I had inspected all the main clinics of this nature in New York, Boston, New Haven, and Philadelphia. A fallacy has grown up in England that rheumatism is almost unknown in America, probably due to the fact that American physicians coming from the Southern and Western States, where the disease is rare, are always demanding to be shown rheumatic nodules in London hospitals. This does not apply to the Northern States, and New York claims nearly as much rheumatism as London. So much is this the case that a definite effort has been made to study the disease by means of an elaborate organisation centred in New York with cardiac clinics allied to it all over the country. In these the notes are taken on special forms, carbon copies of which are sent to the headquarters in New York.

The most perfect of such clinics for children is probably that of Dr. May Wilson, at the Nursery and Childs Hospital, New York, where a clinic of 500 children has been in existence for nearly ten years. Case notes are taken on the special forms mentioned, and the children classified into five groups:—

I. Able to carry on habitual physical activity.
IIa. Able to carry on with slightly diminished physical activity.
IIb. Able to carry on with greatly diminished physical activity.
III. Symptoms of heart failure at rest.
IV. Abnormal signs and symptoms.
V. Potential heart disease (uncomplicated chorea, &c.).

This classification is based on a careful history and physical examination, combined with a fluoroscopic tracing of the heart, the vital capacity, exercise tests, and in some cases electrocardiograms and leucocyte counts. Controversy has raged over the value of these tests, and from my own work which, in my opinion, is but relative, the tests being of little use if performed on a single occasion. In the case, for instance, of two children of the same age and size, who are eventually classified in the same group, one may have a different normal vital capacity than the other. The tests are, however, of great assistance in judging how any one case is progressing. If a child is going down hill, or if reinfection has taken place in an old case, although the weight, temperature, pulse, and physical signs may show little change, the vital capacity will usually fall at once, the heart will show a longer interval before it returns to normal after exercise, the leucocyte count will rise, while the fluoroscopic tracing will often show a slight dilatation that percussion has failed to demonstrate.

These clinics are of inestimable value to the child who is under the constant care of the same physician over a number of years, and eventually handed on to an adult clinic with a complete clinical history. At the same time the clinics amass statistics which are easily examined. Dr. Wilson, for instance, has shown that tonsillectomy has little or no beneficial effect on chorea, and only slightly more on other forms of rheumatism; that rheumatism is not confined to the very poor, but is common in the children of the artisan class. Surely, if a system of clinics, modified to suit the conditions, were established in all the great medical centres of this country, where rheumatism is so universal, and its clinical interpretation so generally understood, it should be possible to amass such a vast number of figures, that the problem of predisposing factors could rapidly be settled. If at the same time these clinics were in close touch with laboratory research, it is not too much to hope that the great problem of what is the infecting agent, which has baffled the profession for so long, might at last be cleared up, and a new era inaugurated for the treatment of the disease.

I am, Sir, yours faithfully,

W. ROBERT F. COLLIS, M.B. Camb., M.R.C.P.,
late Temp. Assistant Physician, Johns Hopkins Hospital.
July 14th, 1928.

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[1] THE LANCET, May 19th, p. 1005.

[2] Ibid., p. 1017.

RESULTS OF SURGERY IN CARCINOMA OF THE CERVIX UTERI.

To the Editor of THE LANCET.

SIR,—I should be much obliged if you would allow me to correct the figures appearing in the report of the remarks I made last week at the International Conference on Cancer in your last week's issue (p. 142). These figures should read:—

> Up to the end of 1927 he had performed Wertheim's operation 351 times. There were 53 deaths due to the operation—an operative mortality of 15·1 per cent. Of the 298 patients who survived the operation, 139 had died of recurrence, and of the remaining 159, 13 had died of other disease, of whom 6 survived over 5 years (3 survived over 10 years) and 30 had been lost sight of, 17 after they had passed the 5-year limit (5 had passed the 10-year limit), and there were 116 patients whom he was still in touch with. Of these latter 64 had passed the 5-year limit (35 had passed the 10-year limit), whilst the remaining 52 had been operated on at periods less than 5 years ago. In all, then, 87 patients had survived the operation 5 or more years, 43 of whom had survived it 10 or more years.

I am, Sir, yours faithfully,

VICTOR BONNEY.

Devonshire-place, W., July 24th, 1928.

DIPHTHERIA CARRIERS.

To the Editor of THE LANCET.

SIR,—I was much interested in Mr. Yearsley's letter on the occurrence of Klebs-Löffler bacilli in the cavity of a decayed tooth. I came across one such instance myself during my investigation on diphtheria carriers. The case was, briefly, as follows:—

> A boy of 5 years of age had shown persistently positive throat and nose cultures for several months. He had very decayed teeth, and it was thought that these might be acting as foci for the growth of K.L.B. Cultures were taken from the gums around the base of six of the most decayed teeth. Yeasts were obtained from all of the teeth sockets, and, in addition, K.L.B. were obtained from the region surrounding a decayed right upper incisor. These decayed teeth were all removed, but the throat and nose cultures still remained positive, and the child did not clear up until he was put on nasal douches.

I did not allude to this case in my article, as I regarded the occurrence as too rare to be of practical importance.—I am, Sir, yours faithfully,

WM. CLUNIE HARVEY.

Borough Sanatorium, Brighton, July 22nd, 1928.

THE MAINTENANCE OF ORPHANS OF MEDICAL MEN DURING THE HOLIDAYS.

To the Editor of THE LANCET.

SIR,—The applications for assistance from the Royal Medical Benevolent Fund have in recent months been exceptionally numerous and urgent. A special plea which appears at this time of the year is for help for children. In coöperation with our Ladies' Guild and other bodies the Committee of this Fund is often able to secure admission of children of deceased medical practitioners to orphanages or schools where free education is given.

During the holidays provision must be made for these children, and when there are no friends or no friends in a position to receive them, the difficulty is great. The Committee does what is possible, but their efforts are much hampered by the lack of funds. Further subscriptions and donations will be gratefully received at 11, Chandos-street, Cavendish-square, London, W.1.

I am, Sir, yours faithfully,

July 23rd, 1928. THOS. BARLOW, President.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

CRITICISM OF HOME OFFICE ADMINISTRATION.

ON July 11th the House went into Committee on a vote of £283,588 for the salaries and expenses of the Home Office, Mr. J. F. HOPE (Chairman of Committees) being in the chair.

Factory Inspection.

Mr. RHYS DAVIES moved to reduce the vote by £100. He said that he did not think there was a better test of the efficiency of the Home Office than the number of accidents to workpeople in the factories and workshops of the country. In 1926 there were 139,963 accidents of that kind of which 806 proved fatal. In 1927 the number had reached the colossal figure of 156,974, of which 973 proved fatal. That was to say, that there was an increase in one year of 17,011 in the total number of accidents and of 166 in the number of fatalities. The Home Office had issued a circular dated May 16th, 1927, to employers stating that the Home Secretary had been much concerned to learn from the Chief Inspector of Factories that progress in the development of "safety first" arrangements in factories continued to be disappointingly small. The need of such an arrangement in industry elsewhere was great. The total number of accidents reported in the Factory Department showed no sign whatever of any substantial reduction. That circular showed that the Home Office was fully aware of what was happening in regard to the alarming growth of accidents in factories and workshops. He would not say a word against the personnel of the inspection department of the Home Office, but he felt sure that there was a distinct relationship between the number of accidents on the one hand and the number of inspectors employed and the number of visits paid to factories and workshops on the other. In 1914 there were 222 inspectors; that number has dwindled since until at the end of March, 1928, the number stood at only 206, or a decrease of 16. While the best employers no doubt did their duty according to the rules and regulations issued by the Home Office, there were some employers who paid no heed to the law in this respect and did all they could to escape their responsibilities. He urged that there ought to be an increase in the number of factory inspectors, and more women inspectors ought to be employed. He was delighted that the Home Office had instructed Sir Malcolm Delevingne to deliver a speech at Geneva in favour of a "Safety First" Convention, but it was very little use asking for an international convention in favour of the prevention of accidents when this country was not doing all it could in that direction on behalf of its own workpeople. There was another point which he would like to raise. In 1926 Parliament passed an Act prohibiting the use of white lead in painting for interior purposes. The time had arrived when they ought to know the results of the operation of that Act. He was a little alarmed at the figures relating to lead poisoning generally. In 1922 the number of cases reported to the Home Office was 247 with 26 deaths. The number grew until in 1924 it reached a peak figure which was very alarming indeed. The number of deaths in 1927 was reduced to 14, but the reported cases numbered 249 for 1927, or an increase of 2 over 1922. With regard to lead poisoning among house painters the figure in 1922 was 40 cases with 12 deaths, but in 1927 there were 98 cases reported and 21 deaths. That was indeed an alarming state of affairs. He would like to know how many offences had been notified under the 1926 Act and how many convictions had been obtained. In 1924 a Committee was appointed to inquire into artificial humidity in textile and non-textile factories, and he would like to know what had become of the recommendations of that Committee. A great many of these difficulties would have been cleared away if the Government had carried out its promise to pass a Factory Bill. It seemed to him that the Home Office ought to deal at once with the question of humidity in textile factories because the mortality and sickness figures of some of the approved societies covering textile operatives were really alarming, and some of the diseases shown in the statistics were attributable in part, he understood, to excessive humidity in these factories. He was pleased that the number of new cases of miner's nystagmus was apparently declining. In 1908 the new cases were 386, in 1914 3218, and in 1926 1771. He would like to know what means were being taken to prevent this disease spreading and to deal with it better under the Workmen's Compensation Act. He understood that the Home Office was already conducting an inquiry into silicosis, and he could assure the Government that it was high time that something was done. The problem was urgent because of the increased suffering among coal-miners from this disease. In 1922 there were 45 cases of anthrax reported to the Home Office and five deaths, and he was pleased to say the figures had declined in 1927 to 31 and 2 respectively. The Home Office had appointed a Committee to inquire into the cost of disinfecting East India wool, which was very largely responsible for a number of anthrax cases in this country. He was told that cases had occurred in Bermondsey where men had contracted the disease from hides and skins. He wished to ask whether all these materials could not be disinfected before leaving the port of origin. What was the international position in this matter? He would say, in conclusion, that it was not good enough that in these enlightened days, when they had a much better medical service and better safeguards in factories and workshops, that they should have to register 17,000 odd accidents in 1927 over 1926.

Certifying Surgeons.

Mr. HOLLINS complained of the cumbersome method which surrounded the operation of the Workmen's Compensation (Silicosis) Act of 1918. The Act could only be applied to those industries which made application and for which the Home Office made an Order. Committees had to be appointed and investigations made, and the greatest difficulty was the obstructive methods which could be adopted either by the employers' representatives or the workers' representatives. In the three industries which up to the present had been before the Home Office inquiry there was only one happy result. Owing to this cumbersome machinery and the waste of time involved in obtaining an Order, a very meagre fraction of the total number of workers affected had been brought under the scheme since the Act was passed. The only proper method was to have the disease scheduled as an ordinary occupational disease. Lead poisoning was a cumulative disease and one never knew when the effect would show itself. Persons had shown symptoms of the disease several years after they had left the lead process, and because of the lapse of time since they had worked the process they could not make a claim for compensation. He would urge that if the Home Office could not extend the limit of time indefinitely during which a lead process worker could make such a claim it ought, at any rate, to be extended to a period of three or five years. The present method of appointing certifying surgeons was not a proper method. The best men might be appointed, but they were not appointed because they were experts in lead poisoning, silicosis, or anthrax. In the pottery industry they were paid 1s. per examination, with the result that cases had been known where 20 workers had passed before the certifying surgeon in as many minutes. It was impossible for anybody to make an examination of workers in so short a period of time. Certifying surgeons should be whole-time men without private practice. This had been tried in the Refractories Industries scheme when the tuberculosis officers made the examinations in the first instance. Afterwards permanent full-time men were appointed and it was found that the examinations were more efficient and the data more valuable. He hoped that the Home Secretary would give his attention to the three points he had raised.

Mr. MACKINDER said as one connected with the textile trade he wished to emphasise what had been said regarding the insufficient staff of factory inspectors. He had been from 1914 until last year a member of the Departmental Committee on Anthrax. In 1927 19 cases from wool were reported, three from horsehair, nine from hides and skins, and one from other industries. He would like to know how many of these cases were fatal and how many non-fatal. He did not know whether it was possible—he hardly thought it was—to disinfect the hides in the country of origin, but he was quite certain that it was possible to disinfect the wool in the country of origin. He knew that the number of cases of anthrax was largely decreased as the result of the operation of the very fine Government disinfecting station at Liverpool, but that only dealt with Persian and Egyptian wool, and there were any number of dangerous wools. There was goat hair and camel hair which were also dangerous. He would like the Home Office to interest itself in the inspection of the material used in the production of shaving-brushes. He did not know whether the Home Office was aware of the tremendous danger that the public were running from the use of shaving-brushes made from what was called Chinese tail, or mane hair, which was a material liable to be infected with anthrax. It reached this country in a roundabout way and was made into the cheapest imitation badger hair shaving-brushes, from which it was very easy to get this dangerous and loathsome disease. The Departmental Committee proved that it was possible to get these brushes and materials disinfected and made safe.

A Second Ministry of Health.

Lieut.-Colonel FREMANTLE said that the latest figures with regard to lead poisoning given in the report for 1926 were certainly disconcerting. It was true that there were fewer cases, but there were something like double the number of deaths from lead poisoning in the last year reported upon as compared with the previous year, and that was a matter which needed to be cleared up. It was no doubt too early to get definite information as to how far the Act of 1926 had taken effect; but if the Home Office could give them any information they would be glad to have it. The general line of the 1926 Act was to prohibit painting by women and young persons and to give power to the Home Secretary to issue regulations. That he thought was the right method. He objected to prohibition wherever it was possible to avoid it. They wanted to work up as much as possible the question of education and inspection. The factory inspector was one of the most valuable administrators and forms of education. But they could not expect to get efficient inspection when the inspectors came from a distance. They must delegate the people who were on the spot, who could drop in and see how things were going on. There was already a certain amount of sanitary inspection and the sanitary inspectors and medical officers of health had to furnish copies of their annual reports. He wanted to extend that system. He believed that they could extend it very considerably in the larger cities and boroughs, where they could use the local medical officer of health more and more. That was a matter which had to be remembered when they were considering the inadequacy of the inspectorate and the actual official reply that they could not afford to have more inspectors. He thought they were on the wrong line if they were seeking to increase the centralised bureaucratic inspectorate. They ought to open up the factory system to local people, who would gladly take an interest in it. He was afraid that the suggestion made by Mr. Hollins that certifying surgeons should be whole-time men was quite impracticable. These surgeons had to be dotted about all over the place. They ought to be given an opportunity of being more useful than they were at present. The certifying factory surgeon only had certain inspections detailed to him when called for by the factory inspector. He could not be expected, therefore, to sift through the whole of the cases that could be improved because he only had cases of definite illness or cases that required attention by the lay inspector. He would like to have some account of the extremely beneficent welfare work in the factories which had been extended so much since the war. It was a very hopeful work, instituted during the war in the Department of Munitions by one of the factory medical inspectors attached to the Ministry for the purpose, and the Home Office had followed it up since. His latest information was that statutory welfare orders had been made for 14 industries so far. He would be glad to know if they were going to be extended further. He had always taken intense interest in the Factory Department of the Home Office. It was nothing less than a second Ministry of Health on which the health and efficiency of the nation depended.

Mr. JENKINS said that in consequence of recent appeals in regard to the effect of silicosis among miners the Home Office had appointed a medical man, but one medical man for the whole country was totally inadequate to meet the needs of the mining and other industries and to investigate and make reports on cases. The Home Office ought to appoint larger staffs of medical men for this purpose. The same applied to nystagmus.

Reporting of Accidents.

Dr. VERNON DAVIES said that he was an old certifying factory surgeon of over 20 years' experience. There had been a justifiable complaint that evening of the small number of factory inspectors. During the war the Home Office took what he regarded as a very retrograde step. Up to that period practically all accidents were notified to the certifying factory surgeon, who had to visit the factory to see the identical place where the accident occurred, to get a report, then proceed to see the injured person and get his or her report, and finally to issue a report to the factory inspector and so to the Home Office. By that process two or three very important things were done. In the first place they were sure that the mill authorities reported the majority of their accidents, because they never knew what doctor a particular patient might go to, and news of an accident might leak out and reach the factory surgeon. Therefore they were compelled to carry out the regulations and report their accidents more closely. The second good point was that it enabled them to forward true accident reports. On more than one occasion he found in his investigations that the report sent to him by the mill authorities was not accurate. On the other hand he knew from his experience that unfenced machinery was not always the fault of the employers. It was sometimes the fault of the workers; they did not like the guard, and they removed it. The Home Office decided to do away with this reporting of accidents to the certifying surgeon because it cost the country the enormous sum of £7000 per annum. It was quite possible to report an accident so as to create a false impression, and it was possible that there were many accidents which ought to be inspected by the factory inspector which were not so inspected. Therefore in his opinion the Home Office took a retrograde step by cancelling the reporting of accidents by certifying surgeons. That procedure was to the advantage of the Home Office, to the advantage of the workers, and to the advantage of the mill, and he hoped that some time or other they would reconsider the position and see if they could not go back to the old method of reporting accidents. The fact that the mill authorities knew that the factory doctor might be in the mill any day kept them up to the mark. With regard to nystagmus the figures were going up. Some time ago, when he was looking at the figures for Belgium, he found that there was not the same rate of increase in nystagmus there as there was in this country. In Belgium compensation was only given for nystagmus for a certain definite time, at the end of which the compensation ceased, and for some remarkable reason the cases improved. That reminded him of the old days of the "railway spine," when people after railway accidents got concussion of the spine and never got better until the case was settled by the company. Sir William Thorburn, an eminent surgeon who was probably the greatest expert on "railway spine" in Europe, came to the conclusion and advised all his clients that the patient would never get better until the claim was settled. These people were not malingering, but there was some psychological condition which prevented them getting better until their claim was paid. He wondered whether in this country the same sort of thing was happening in regard to nystagmus, and whether it would not be better instead of saying that the man should be paid so much per week to give him a lump sum by way of compensation, which might have some effect on the recovery of the patient.

Mr. CONNOLLY: Do you think that as a medical man?

Dr. VERNON DAVIES said that he was arguing this matter from a medical standpoint and suggesting that a new method of compensation might be tried as an experiment. Silicosis was becoming more important every day, and he thought that it had been grossly neglected in this country. It really was rather astonishing, considering our huge mining industry, employing an enormous number of men, that a medical man should only have been appointed a few months ago by the Government for the first time to advise them on the medical conditions affecting this industry. The mining industry had been run for years [illegible] supervision. Another remarka[illegible] wished to work in a factory or workshop it had to be examined by a certifying surgeon who certified whether the child was fit to work or not. That was not the case so far as the mines were concerned, and over and over again he had refused to pass children for work in the cotton mills because they were not strong enough, but they could laugh at him and go and get work in the pits without any examination at all.

Sir VIVIAN HENDERSON, Under-Secretary for the Home Office, said that that matter was not under the control of the Home Office.

Miners and Silicosis.

Dr. VERNON DAVIES said in that case he would not pursue the subject. Silicosis by itself was not a very dangerous disease. The worst it did was to cause shortness of breath and perhaps a little difficulty in breathing. The danger came in when it became contaminated or infected with tubercle, and when they got that condition it was extremely dangerous and fatal. Considering the risks which miners ran in working in this rock dust it was high time that stringent regulations were made by the Home Office to deal with the problem. They had to bear in mind that certain people were perhaps more liable to infection by tubercle than others, and therefore in any scheme brought up to deal with the matter the health of the miner prior to and during his employment was very important. In any scheme brought forward to make silicosis a scheduled disease he presumed that the Home Office would have some control. He was convinced that the examination of the patient for silicosis should not be given to ordinary medical men, but should be done by Home Office specialists, because it was extremely difficult to diagnose accurately, especially in the early stage. It was very essential to have an expert radiographer, and the Home Office should consider the advisability of appointing a few specialists in this particular disease who could go round the country examining patients at different mines at definite regular periods. It was no use waiting until the man could not work; he should be examined regularly. It would only be necessary to examine the mines where there was a large amount of silica. Coal dust itself did not produce silicosis; in fact it did good, because it lessened the liability to consumption. Colliers were among the healthiest people in the country, and statistics proved that they were less subject to pulmonary tuberculosis than any other grade of workers, except agricultural workers. If his suggestion was carried into effect they would improve the health of the miner and prevent a certain number of deaths by getting a man away from the pits when he was in a recoverable state.

Shuttle-kissing.

Mr. T. **Shaw** said there was a museum in London which contained an extraordinarily interesting collection of safety appliances for machines and also a number of diagrams of great interest and value to those engaged in industrial occupations. He wished to pay his tribute to that part of the Home Office work and to express the hope that it would be developed. The principal thing to which he wished to refer—and he believed that the matter could be dealt with by administrative order from the Home Office—was the practice known in Lancashire as shuttle-kissing. They never could get a body of medical opinion to say that this practice was dangerous, yet nearly every weaver over 20 years of age in Lancashire had either very badly decayed teeth or was wearing artificial teeth. Surely there was a connexion between the constant kissing of the shuttle with the drawing of the weft and the dust into the mouth and this extremely high average of decayed teeth among weavers. In any case it was a disgusting, dirty, and dangerous habit. It often happened that during an influenza epidemic a weaver left his work with influenza. The weaver who took his place used the shuttle and quickly went off work with influenza. It often happened that two, three, or even four weavers used the same loom and the same shuttle and went off work one after another. Further, in cases where colours were used of a free type the weaver had his lips and mouth dyed by the colour that was used. He had seen weavers with their lips, teeth, and inside of the mouth green, blue, and red, and the whole of their arm covered with a kind of fine dust which "ran" when perspiration took place. They could understand what it meant to a person drawing that kind of thing into the mouth day in and day out. He distinctly remembered a case which happened in his youth when he was working in a mill. A man who was afflicted with a very loathsome disease went away from his work and the man who followed him on his looms contracted the same disease. Nothing ought to stand in the way of the replacement of the shuttles by hand-threaded shuttles, if that could be done. He asked the Home Office seriously to consider making an order which would do away with this dangerous and disgusting practice.

Lieut.-Colonel **Watts-Morgan** urged the appointment of a larger number of medical men to carry out research work and inspection. He also suggested that compulsory insurance against injuries sustained by these workers should be applied to all colliery companies.

Mr. **Connolly** referred to certain new draft regulations which he said were about to be issued by the Home Office in connexion with the use of the oxy-acetylene welding machine in ships and elsewhere. This question arose out of a fatal accident on the Mersey in which two men lost their lives through an explosion in a confined space. The proposed new regulations which he believed were based upon that accident provided that prior to a welding operation by the oxy-acetylene machine there must be first of all a purifying of the air in the space where the machine was to work and that during the operation there must be a continual supply of fresh air. That was all very well as far as it went, but to meet practical needs the use of this machine in confined spaces ought to be totally prohibited. Provision should be made that nothing but the electric welder should be used in cases of this kind.

Under-Secretary's Reply.

Sir V. **Henderson**, replying to the debate, said that if they were going to make any comparison of figures relative to industrial accidents the two years that they ought to compare were 1927 and 1925. In 1925 there were 159,693 accidents, of which 944 were fatal, as compared with 156,974 in 1927, of which 973 were fatal. Therefore on figures alone he did not think that any great case could be made out against the Factory Department of the Home Office. He agreed that there was a slight reduction in the inspectorate compared with the pre-war staff. The present position, he admitted, was not satisfactory, and he hoped it might be possible to obtain an increased number of inspectors. But there had been no slackening in regard to the inspection of factories. That inspection had been more complete and thorough than in previous years, and if there had been any slackening it had been in regard to the inspection of small workshops where there was not generally the same risk. This question must to a large extent be mixed up with that of the Factories Bill. That Bill had been held up for the moment—he hoped only for the moment—but when it reached the Statute Book it would carry with it obligations on the Factory Department which would necessitate an increase in the number of inspectors. In order to show that the Home Office really had this matter at heart the Home Secretary had promised in the autumn to set up a small committee to go into the question of the staffing and organisation of the factory inspectorate at the Home Office, and he (Sir V. Henderson) hoped that he might be chairman of that Committee. Therefore the matter would not be lost sight of. As a result of the "Safety First" circular, which had been referred to in the debate, the Home Office had received very satisfactory assurances from a number of important employers' organisations, and they were assured that the matter was bearing fruit by reports they had received from their inspectors. As regarded the danger from shaving-brushes infected with anthrax, the Ministry of Health already had power to prohibit the importation of dangerous brushes. A proposal had been made to both sides of the painting industry to coöperate with the Home Office in carrying out the lead paint regulations. That coöperation had been given and the figures proved that the position was improving. So far as nystagmus was concerned, he had not the figures for 1927. The Home Office was only concerned with nystagmus from the point of view of compensation and not from that of prevention, which was a matter for the Mines Department. He fully endorsed everything which Mr. Mackinder had said about the excellent work which was being done at the disinfecting station at Liverpool, but he would realise that it was not possible for that station to deal with the disinfection of hides. No satisfactory system had yet been discovered for that purpose, although inquiry was being made. The report as to the further scheduling of wool for disinfection was now in the hands of the Home Secretary, but had not yet been published. From the point of view of expense it was extremely reassuring—much more so than some people anticipated. Hon. Members ought to rest assured that this matter would receive very sympathetic consideration. So far as the international aspect of the question was concerned, Australia and India had always refused to coöperate, and so long as that attitude was maintained it was really impossible to deal with the question internationally. The question of silicosis was surrounded with enormous difficulties. Whilst the Home Secretary was prepared to consider whether he could amend or improve or expedite matters it was quite likely that it would entail legislation, and therefore he (Sir V. Henderson) could not discuss it that night. With regard to what Mr. T. Shaw had said about shuttle-kissing, the Home Secretary had announced that he would be quite prepared to consider dealing with it in a clause in the Factories Bill if he could have some general information that it was desired by the vast majority of the workers concerned.

Mr. **Shaw** said that he would give that information at the earliest possible opportunity.

Sir V. **Henderson** said that he was inclined to agree with some of the strictures passed by Mr. Hollins on the subject of certifying surgeons. But if they were going to alter the whole system of certifying surgeons legislation would be required, and therefore it was a matter which he could not discuss in detail that night. There was also a very important matter which not only arose generally as to the certifying surgeons, but particularly in regard to silicosis, and that was that they knew that the certifying surgeon in normal circumstances was not competent to examine silicosis cases. If they were to alter the whole position of the certifying surgeon and have a full-time medical expert on a definite salary they would have to get a Home Office medical staff or something of that kind. Quite apart from legislation that would require some compensation fund or medical fund into which the employers would pay, so that the medical men could be paid for their services. The matter was extremely complicated, but it was being looked into. While he would be glad to look into the point raised by Mr. Connolly in regard to the use of the oxy-acetylene welding machine he was not prepared to give any definite undertaking on the matter at the moment.

The motion to reduce the vote was negatived by 212 votes to 110.

BILLS ADVANCED.

The Food and Drugs (Adulteration) Bill passed through Committee on recommitment in the House of Lords on Wednesday, July 18th. This measure passed the Report stage in the House of Lords on Thursday, July 19th. The Child Destruction Bill was read a first time in the House of Commons on Tuesday, July 17th.

In the House of Lords on Monday, July 23rd, the Marriages (Prohibited Degrees of Relationship) Bill was read a second time. The Food and Drugs (Adulteration) Bill was read the third time, and passed. The Reorganisation of Offices (Scotland)Bill passed through Committee.

HOUSE OF COMMONS.

WEDNESDAY, JULY 18TH.

Lysol Poisoning.

Sir F. MEYER asked the Home Secretary whether his attention has been called to the numerous deaths, either accidental or suicidal, following upon the taking of lysol, which had recently been reported, and if he could state the total number of such deaths during 1927 and also during the first six months of 1928.—Sir W. JOYNSON-HICKS replied: I am aware that of recent years there has been a considerable increase in the number of deaths from the taking of lysol, and my Department has brought the relevant mortality statistics to the notice of the Inter-Departmental Committee which is considering the law relating to the sale of poisons. The figures for 1928 are not yet available: those for 1927, which are provisional, are as follows: Deaths from lysol poisoning: by accident, 13; by suicide, 361.

Registration of Births and Deaths.

Sir NICHOLAS GRATTAN-DOYLE asked the Minister of Health whether the registration of births and deaths, under his plans for the reform of the machinery of local government, would be severed from the poor-law administration. —Mr. CHAMBERLAIN replied: The exact arrangements to be made in regard to the registration service in connexion with the scheme of local government reform are still under consideration, and my right hon. friend regrets that he is not in a position to make a statement on the subject.

THURSDAY, JULY 19TH.

The Dangers of the Use of Allonal.

Mr. Robert Young asked the Secretary of State for the Home Department whether the German drug allonal was among those governed by the Dangerous Drugs Act: if not, whether he was aware of the growing demand for this drug and of the danger entailed in its use; and whether he would take steps to ensure that allonal should not be available without a doctor's prescription.—Sir WILLIAM JOYNSON-HICKS replied: The Dangerous Drugs Acts do not apply to "allonal," which is understood to be the proprietary name given by a Swiss firm of manufacturing chemists to a derivative of barbituric acid. I am aware of the dangers, and have brought the question of the need for further restrictions in the case of these drugs before the Inter-Departmental Committee which has been examining the law relating to poisons.

Slaughter of Tuberculous Cows.

Mr. BUXTON asked the Minister of Agriculture the number of cows affected by tuberculosis which had been slaughtered in 1926 and 1927 in pursuance of the Tuberculosis Order. 1925: and whether he was satisfied that the order was fully operative.—Mr. GUINNESS replied: The number of cows (including heifers) slaughtered under the provisions of the Tuberculosis Order, 1925, in 1926 and 1927 is 16,522 and 16,708 respectively. Local authorities have now completed their arrangements for carrying out the requirements of the Order, and I am satisfied that the Order is properly executed.

Mr. BUXTON: Does the Minister not think that in view of the increase, an increase in the staff of inspectors is needed? —Mr. GUINNESS: I do not think so; the local authorities seem to be carrying out their duties satisfactorily.

Treatment of Lunacy and Mental Disorders.

Mr. PETHICK-LAWRENCE asked the Minister of Health what steps, if any, he was proposing to take to implement the administrative recommendations of the Royal Commission on Lunacy and Mental Disorder; and, in particular, whether he could see his way to do anything for those suffering from the effects of sleepy-sickness who were not suitable either for lunatic asylums or poor-law institutions.—Mr. CHAMBERLAIN replied: I have arranged that the administrative recommendations of this Commission are borne constantly in mind in the day-to-day administration of the Lunacy Acts, and are worked to so far as is practicable in present circumstances. The problem presented by the after-effects of encephalitis lethargica is under constant review: and it will no doubt be possible to deal with certain of these patients under the Mental Deficiency Act passed last year, which amended the definition of mental defect for this purpose.

Dr. Voronoff's Experiments.

Mr. BRIANT asked the Secretary of State for the Home Department if the licences granted for permission to practise vivisection include power to carry out such operations of the grafting of glands as had been practised by Dr. Voronoff in other countries.—Sir WILLIAM JOYNSON-HICKS replied: I assume that the hon. Member refers to the reported experiment on a monkey to which his question of June 13th related. No such experiment has been, or will be, permitted in this country.

Deaths from Puerperal Causes.

Mr. VIANT asked the Secretary of State for the Home Department whether he was prepared to order that an inquiry shall be held in all cases where death had resulted from puerperal causes.—Sir WILLIAM JOYNSON-HICKS replied: I have no power to make such an order. But I understand that my right hon. friend, the Minister of Health, is arranging, with the concurrence of the British Medical Association, for maternal deaths to be investigated for scientific and public health purposes by competent medical officers in each area, and that these investigations will be considered by the Committee on Maternal Mortality which he has recently appointed.

Voluntary Health Insurance Contributors.

Major CARVER asked the Minister of Health if he was still considering the possibility of grafting on to existing national health insurance a scheme for the benefit of voluntary contributors other than those now included.—Mr. CHAMBERLAIN replied: The possibility of widening the scope of voluntary insurance under the joint scheme of National Health Insurance and contributory pensions is still under consideration, but I regret that I have not yet found any satisfactory solution of the very serious difficulties which any such proposal presents.

MONDAY, JULY 23RD.

Exemption from Duty of Scientific Films.

The House considered the Finance Bill on Report.

Captain FRASER moved a new clause, providing that the Customs duties imposed by Subsection (1) of Section 3 of the Finance Act, 1925, on negative and positive cinematograph films should cease to be payable in the case of a film which was certified by the Royal Society of London for Promoting Natural Knowledge to be solely an illustration of scientific investigation for exhibition before members of a recognised scientific body, and which was imported only for the purpose of such exhibition free of charge. The clause also provided that if any person exhibited otherwise than as provided under the clause, any film which had been exempted from duty under the section, he should, on summary conviction, be liable in respect of each offence to a fine not exceeding £50. Captain Fraser said that in 1925, under the Finance Act, a tax was placed on films imported into this country. At that time it was probably not realised that films, apart from being a means of amusement and education, were also sometimes used as a record of scientific work of no interest to the general public, but of very great value to a limited number of scientific workers. In the last two or three years great developments had taken place in the technique of the use of films as a record and illustration of scientific research. It was generally agreed that it was undesirable to place a tax upon scientific work, or indeed upon knowledge of any kind. When the matter was discussed on an earlier stage of the Finance Bill, the Financial Secretary to the Treasury and the Chancellor of the Exchequer said that the administrative difficulties were very great, but that they would do their best to meet the point. He (Captain Fraser) was happy to say that, by the instructions of the Chancellor of the Exchequer, conversations had taken place with the Customs officials which led him (Captain Fraser) to suppose that this clause could be worked by them if the House wished to pass it. He was able to say that the Royal Society would undertake the liability which it was suggested they should be asked to undertake. He therefore asked the Financial Secretary if he would accept the clause. He could assure him and the House that if he was willing to do so, men of science would be very grateful and that it would be a gesture of goodwill to those who were doing most valuable work. (Cheers.)

Mr. CRAWFORD, in seconding the clause, said that if the Government could make this concession it would be a help to the scientific and medical world. It would also give a stimulus to a small, but very notable, industry in this country which was concerned in the development and preparation of the best kind of film. He had within his own knowledge two establishments in London where, with the slightest encouragement, negatives of films of all sorts would be sent from all over the world—films which it was desired should be treated in the most expert way possible. This industry had been interrupted a good deal by the imposition of duties on the films, and he hoped the Financial Secretary to the Treasury would realise that if he could make this concession he would do a great deal to help this industry, and would help the scientific world and give a tremendous stimulus to the preparation of scientific films for use in medical and surgical cases.

Mr. A. M. SAMUEL (Financial Secretary to the Treasury) said that he remembered the previous discussion on this matter. The Chancellor of the Exchequer and he were on that occasion very sorry that they could not then accept the new clause for the reason that it was difficult to get a definition of "scientific investigation." The Chancellor of the Exchequer then said that he would look into the matter and see if he could find a way out. He (Mr. Samuel) was very glad to say that he could now accept the clause. They had found a way out to help Captain Fraser. The Royal Society of London was good enough to say that it would certify, when required, a film that was said to be an illustration of scientific investigation. That was a statement which the Customs officials could easily accept. He could not pledge himself as to the cost, but he did not think it would amount to more than £200, and probably would not be so much as that, because in many cases films would not be imported if the duty were imposed on them. The Government were delighted to be able to accept the clause. (Cheers.)

The clause was read a second time and added to the Bill.

Women Officials in the Board of Education.

Mr. PETHICK-LAWRENCE asked the President of the Board of Education whether his attention had been drawn to the fact that, excluding the inspectorate, and those employed on clerical duties, there were no women in the Board of Education; and whether, in view of the desirability of associating women with this work, he would take steps when future vacancies occurred to appoint women by promotion, transfer, or otherwise to responsible posts under the Board.—Lord EUSTACE PERCY replied: In addition to the women inspectors and women executive and clerical officers, the Board of Education staff includes a chief woman medical adviser, two women medical officers, a woman administrative officer, and a woman librarian. A woman was among the six candidates recently interviewed for a vacancy in the administrative class, which was filled by promotion, and women are equally eligible with men for vacancies filled from the Civil Service competitive examination.

Social Hygiene in the Colonies.

Viscount SANDON asked the Secretary of State for the Colonies whether the Under Secretary of State, on his recent visit to the Straits Settlements, investigated any of the problems dealt with in the 1924 Report on Social Hygiene; whether the situation was now better or worse than at that time: and whether any further steps were to be suggested or taken to remedy the evils that were therein stated to exist.—Mr. AMERY replied: The Under Secretary of State for the Colonies had some discussion about this matter with the Governor of the Straits Settlements and his advisers during his recent visit to Malaya. The Government concerned are proceeding on the lines recommended by the Committee in question, which recognised that improvement in this, as in other matters of social welfare, must necessarily be gradual. I understand that the situation already shows some improvement, and that it is not considered that any steps other than those recommended by the Committee can usefully be taken at present.

TUESDAY, JULY 24TH.

River Pollution and Public Health.

Sir ARTHUR CHURCHMAN asked the Minister of Health whether his attention had been called to the serious pollution of the River Gipping caused by effluent from the artificial silk works at Stowmarket; whether he was aware that there had been numerous cases of illness among human beings and poisoning of stock as a result; and whether, to avoid the consequences of further delay in abating the nuisance, he would authorise the local authorities concerned to take immediate action without waiting for an official inquiry.—Sir KINGSLEY WOOD replied: My right hon. friend is aware of this case. He has no confirmation of cases of illness or of poisoning of stock from pollution. My right hon. friend has, however, received from the Rural District Council an application for consent to take proceedings against the company, and has directed a public inquiry to be held at the earliest practicable date into the application. He is afraid that an inquiry must first be held.

Poisoning Caused by Lemonade.

Mr. WILLIAM THORNE asked the Minister of Health if his attention had been called to a report by the Newcastle city analyst about the illness of at least 50 of the staff of one of the big shops in the city caused by antimony compounds contained in the lemonade which the assistants drank; if he was aware that the cause of the illness was in consequence of the enamel on the buckets which contained the made-up lemonade; and if he could state whether he intended taking any action in the matter.—Sir KINGSLEY WOOD replied: My right hon. friend's attention has been drawn to this case and he understands that the facts are as stated in the question. The city medical officer of health is preparing a report on the occurrence and on receipt of that report my right hon. friend will consider what action, if any, can be taken.

Medical News.

UNIVERSITY OF LONDON.—At recent examinations the following candidates were successful:—

M.D. EXAMINATION.

Branch I., Medicine.—Margery G. Blackie, London (R.F.H.) Sch. of Med. for Women; Frank R. Fletcher, London Hosp.; Francis H. K. Green, St. Bart.'s Hosp.; Bertram H. Jones, St. Thomas's Hosp.; John W. Joule and Robert A. E. Klaber, St. Bart.'s Hosp.; Geoffrey L. S. Kohnstam, King's Coll. Hosp.; Patrick H. O'Donovan, London Hosp.; Navroji Kharshedji Sabiar, Grant Med. Coll., Bombay, and Univ. Coll. Hosp.; and Ian H. Stevens, Univ. Coll. Hosp.

Branch II., Pathology.—Cicely Weatherall, London (R.F.H.) Sch. of Med. for Women.

Branch III., Psychological Medicine.—Norman Moulson, St. Bart.'s Hosp.

Branch IV., Midwifery and Diseases of Women—John J. R. Robinson, St. Thomas's Hosp.; Stephen J. Scurlock, London Hosp.; and Arthur J. Wrigley (University Medal), St. Thomas's Hosp.

Branch V., State Medicine.—William G. Booth, Guy's Hosp.

Branch VI., Tropical Medicine.—Percy C. C. Garnham (University Medal), St. Bart.'s Hosp.

M.S. EXAMINATION.

Branch I., Surgery.—Geraldine M. Barry, London (R.F.H.) Sch. of Med. for Women; Harold C. Edwards, King's Coll. Hosp.; and Gerald H. Steele, Univ. Coll. Hosp.

DIPLOMA IN BACTERIOLOGY.

Mohamed Abd El-Hamid Gohar, Kumarapuram Vythilinga Krishnan, Ram Bihari Lal, Marion Watson, and James A. Young.

B.SC. EXAMINATION.

Physiology.—Agnes Shore (first-class honours), Univ. Coll.; and Effie Slater (second-class honours), Univ. of Leeds.

At a meeting of the Senate on July 18th an offer was accepted from H.R.H. the Duke of Connaught to transfer to the University the Duchess of Connaught Memorial Hostel, and a committee was appointed to manage it as a hall of residence for students of European origin, preference, if necessary, being given to men from Canada and the other Dominions.

Mr. Robert Donaldson, M.D., Ch.B. Edin., F.R.C.S.E., D.P.H., was appointed as from August 1st, 1928, to the Sir William Dunn Chair of Pathology tenable at Guy's Hospital Medical School. Dr. Donaldson was demonstrator in pathology, University of Sheffield, 1909-11; senior demonstrator and lecturer, Bristol University, 1911-12; pathologist to the Royal Berks Hospital, Reading, 1912-20; and since January, 1920, has been pathologist to St. George's Hospital, and lecturer in pathology in the medical school there. He is also pathologist to St. Mary Abbot's Hospital.

the Princess Louise Hospital for Children, and the Hospital of St. John and St. Elizabeth.

Mr. S. J. Cowell, M.B., B.Ch. Camb., M.R.C.P., M.R.C.S., was appointed as from Sept. 1st, 1928, to the University Chair of Dietetics tenable at St. Thomas's Hospital Medical School. Dr. Cowell was appointed in December, 1920, junior assistant to the medical unit at University College Hospital, and since January, 1923, has been assistant to Prof. E. Mellanby at the University and Royal Infirmary, Sheffield. His recent work includes papers on the effect of iodine on hyperthyroidism in man and the action of irradiated ergosterol in human rickets.

Mr. H. D. Wright, M.D., Ch.B., D.Sc. Edin., B.A. Tasmania, M.R.C.P.E., was appointed as from Oct. 1st, 1928, to the University Readership in Bacteriology tenable at University College Hospital Medical School. Dr. Wright obtained the M.D. degree and gold medal at the University of Edinburgh in 1925, and the D.Sc. degree in 1927. He was Lister Research Fellow of the R.C.P., Edinburgh, in 1922. From 1920–23 he was lecturer in bacteriology in Edinburgh University, and from 1921–23 assistant director of the Research Laboratory of the Royal College of Physicians, Edinburgh. Since 1923 he has been lecturer in bacteriology at University College Hospital Medical School. He is assistant editor of the *Journal of Pathology and Bacteriology*.

Mr. S. L. Baker, M.R.C.S., D.P.H., was appointed as from Sept. 1st, 1928, to the University Readership in Morbid Anatomy and Histology tenable at Middlesex Hospital Medical School. Mr. Baker has held the posts of pathologist to the King Edward VII Sanatorium, Midhurst, 1919–22; senior assistant in the Bland-Sutton Institute of Pathology since July, 1922, and lecturer in morbid histology at the Middlesex Hospital Medical School since May, 1923.

The title of Professor of Morbid Anatomy in the University was conferred on Dr. G. W. de P. Nicholson in respect of the part-time post held by him at Guy's Hospital Medical School.

The title of Professor of Bacteriology in the University was conferred on Dr. Alexander Fleming in respect of the part-time post held by him at St. Mary's Hospital Medical School.

In view of Mr. S. A. Courtauld's munificent gifts for the Institute of Biochemistry and the Medical School of the Middlesex Hospital, it was resolved that the title of the University Chair of Biochemistry tenable at that Medical School should be changed to "Courtauld Chair of Biochemistry in the University of London."

King's College of Household and Social Science was admitted as a school of the University in the Faculty of Science (Household and Social Science only).

Sir Holburt Waring was appointed representative at the Seventh Centenary Celebrations of the University of Toulouse to be held in June, 1929. He has also been elected chairman of the Finance Committee.

Dr. John Fawcett has been elected chairman of the Committee of the Medical Members of the Senate.

Dr. E. Graham Little, M.P., has been re-elected chairman of the Council for External Students.

UNIVERSITY OF MANCHESTER.—The following post-graduate courses have been arranged for 1928–29. They will be mainly clinical in character. A whole-time intensive course in medicine and surgery will be held from Sept. 10th to 29th [illegible] y from Sept. 29th to Oct. [illegible] course will reside at St. [illegible], Manchester. A part-time course in diseases of the eye will be held from Oct. 2nd to Nov. 8th. In the spring of 1929 part-time courses on the application of radiology to medicine in diagnosis and treatment, on diseases of the skin, and on clinical pathology will be given. Clinical assistantships are offered in the medical, surgical, and special departments of the Manchester Royal Infirmary, Ancoats Hospital, and certain special hospitals. Further information, tariff, and syllabus can be obtained from the Dean of the Medical School.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—The first woman to be elected Fellow of the College was introduced at the quarterly meeting of the College held on July 17th, when Dr. A. Justina Wilson, London, took her seat. The President, Dr. Robert A. Fleming, was in the chair.—Dr. G. D. T. Kerr Cross (Natal), Dr. R. H. H. Newton (Edinburgh), Dr. Thomas Ferguson (Darlington), Dr. B. H. H. Neven-Spence, and Dr. R. D. Mackenzie (Edinburgh) were elected Fellows of the College.—Dr. Robert Dods Brown has been appointed Morison lecturer for 1929.—It has been decided to confer the honorary Membership of the College upon Dr. John Stewart Muir, of Selkirk.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College, held on July 19th, the following candidates, having passed the requisite examinations, were admitted Fellows:—

William F. Angus, George I. Boyd, Harold C. Carter, Harman Singh Chhachhi, Ronald O. Davidson, Nevile J. Everard, Edgar S. Freshman, Fred C. Hunt, Stewart Hunter, Clifford S. James, Edward N. Jamieson, Robert O. Jones, James Kemyee, Kedar Nath Kulahreshiba, Arthur Leigh, Bantwal Canapathy Hallya, Willard G. Maclean, Ian H. MacGillivray, Cyril M. Plumptre, George E. J. A. Robinson, Isidore Rosin, Arthur J. Stout, Robert Strang, William R C. Stowe, Beatrice E. Turner and Robert Watson.

The Ivison Macadam Memorial Prize, consisting of bronze medal and set of books, was, after a competitive examination in organic chemistry, awarded to Mr. Maurice Goldfar.

ROCKEFELLER MEDICAL FELLOWSHIPS. — The Medical Research Council announce that on behalf of the Rockefeller Foundation they have made the following awards of Fellowships provided by the Foundation and tenable in the United States of America during the academic year 1928–29. These Fellowships are awarded to graduates who have had some training in research work either in the primary sciences of medicine or in clinical medicine or surgery, and who are likely to profit by a period of work at a university or other chosen centre in America before taking up positions for higher teaching or research in the British Isles:—

Leonard Ernest Bayliss, B.A., Ph.D. Camb., Sharpey scholar at University College, London.

Albert Victor Neale, M.D. Birm., M.R.C.P. Lond., resident medical officer, Children's Hospital, Birmingham.

Francis John Worsley Roughton, M.A., Ph.D. Camb., lecturer in physico-chemical aspects of physiology, University of Cambridge (appointed on special conditions while retaining emoluments from other sources.)

Dorothy Stuart Russell, M.B., B.S. Lond., research worker in the Baron Institute of Pathology, London Hospital.

Arthur Wormall, M.Sc. Leeds, lecturer in biochemistry, University of Leeds.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—In the examinations of the Division of Tropical Medicine and Hygiene, at the end of this term, March–July, the following students passed with distinction:—

C. N. Griffin (winner of Duncan medal), M. C. Cairney, G. L. Chadha, C. D. Newman, and A. N. Sharma.

INTERNATIONAL MEDICAL POST-GRADUATE COURSES IN BERLIN.—The medical faculty of the University of Berlin, with the coöperation of the Lecturer's Association for Medical Continuation Courses and the Kaiserin Friedrich-Haus, which is an institution concerned with the post-graduate education of doctors, have arranged special courses for October, 1928. These will include a general course on pulmonary diseases, Oct. 1st–13th; a special course for nose, throat and ear specialists, Oct. 20th; and a course on pædiatrics, Oct. 15th–27th. A course on new methods in diagnosis and therapeutics with practical work in the wards and laboratories of the City Hospital, Friedrichshain, will also be held. Besides this special programme for October, short courses of two to four weeks and posts as guest-assistant in clinics, hospitals, and laboratories are available by arrangement. The courses are held in German, but many professors are able to lecture in other languages. Further information as to suitable lodgings, costs, and visits to clinics are obtainable from the Kaiserin Friedrich-Haus, 2–4, Luisenplatz, Berlin, NW 6.

THE SUPPLY OF MILK TO MOTHERS AND CHILDREN. The Minister of Health received, on July 24th, a deputation from the representatives of 12 metropolitan borough councils regarding the supply of milk for expectant and nursing mothers and children. The deputation was introduced by Mr. Thurtle, M.P., and Councillor Key, of Poplar, and Councillor Green, of Deptford, also spoke. They urged the reconsideration of letters recently issued by the Minister of Health which announced a reduction in the Exchequer grant for the supply of milk by maternity and child welfare authorities during the present financial year. The Minister said, in reply, that the reduction complained of had been made in view of the general need for economy. The only other way in which the necessary saving could be effected was to stop for the time being any further development of maternity and child welfare services, and it seemed preferable instead to make some reduction in the grants paid for the supply of milk. He was not insisting that local authorities should reduce their expenditure on milk, but had only intimated to them the maximum expenditure for this purpose which he could recognise for grant during the present year.

WELSH NATIONAL MEDICAL SCHOOL.—At a meeting held on July 24th at Bangor the Court of Governors of the University of Wales adopted the Draft Charter establishing the Welsh National Medical School as an independent school of the University. The Draft Charter will now be submitted to the Privy Council. Unfortunately the differences between the staff of the Cardiff Royal Infirmary and the authorities of the school have *not yet been resolved*. The Registrar of the University College of South Wales and Monmouthshire, of which College the school is still a constituent part, has informed present and prospective medical students that, until more complete arrangements have been made between the Hospital and the College authorities, students preparing for degrees and diplomas other than those given by the University of Wales cannot be accepted for courses of instruction in the final subjects.

PAYING PATIENTS AT RUGBY.—Five paying beds, two each for men and women, and one for children, are to be provided at St. Cross Hospital, Rugby. Subscribers with incomes between £300 and £700 a year, and their dependants, will pay £3 3*s.* per week for medical and surgical cases, and £4 4*s.* for complicated maternity cases. These fees will include attendance, ordinary hospital board, R.M.O.'s services, ordinary nursing, ordinary medicines, and ordinary surgical attendance. Non-subscribers will pay £2 2*s.* per week more under each heading. Minor operation fees will range from £3 3*s.* to £6 6*s.*, and major operation fees from £10 10*s.* to £15 15*s.*; the physicians' attendance fee will be a minimum of £3 3*s.*, with £1 1*s.* for each subsequent week.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A special course in diseases of the chest will be held at the Brompton Hospital for one week beginning July 30th (fee, £3 3*s.*). From August 6th to Sept. 1st clinical and cystoscopic demonstrations will be undertaken by the staff at All Saints Hospital, on Mondays, Wednesdays, Thursdays, and Saturdays (fee, £2 12*s.* 6*d.*). *Entrants should apply to the hospital for particulars of* times. For those interested in infants diseases there will be a two weeks' course under Dr. Eric Pritchard's direction at the Infants Hospital from August 13th to 25th (fee £3 3*s.*). Visits will be paid to baby welfare clinics such as that at Thavies Inn, to the Blind Babies' Home, Chorley Wood, &c. The Queen Mary's Hospital staff will undertake an all-day "refresher" course from August 27th to Sept. 8th, consisting of demonstrations in all departments of medicine, surgery, and the specialties, designed especially for panel practitioners (fee, £3 3*s.*). There is also a general course arranged continuously throughout the year for which tickets are issued for periods varying from one week to 12 months. Information, syllabuses, tickets, and copies of the *Post-Graduate Medical Journal* may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

THE ROYAL VICTORIA EYE AND EAR HOSPITAL, DUBLIN.—Last week the Governor-General opened the new wing of this hospital. The wing supplies accommodation for 40 additional patients, besides improving the accommodation for the staff. The funds were provided by the estate of the late Mrs. Harvey Lewis, who left a considerable sum of money to build a hospital in Dublin. As the sum was insufficient for this purpose the executors sought the direction of the Courts, and after hearing many suggestions Mr. Justice Meredith assigned the bequest to the Royal Victoria Eye and Ear Hospital for the extension. The hospital is now probably one of the largest and best equipped in the British Isles. Last year 2017 intern patients were admitted, and 13,863 were attended in the extern department.

STREET NOISES.—At a joint council meeting of the People's League of Health, held at 12, Stratford-place, London, on July 12th, a resolution was passed :—

> That in view of the fact that *eminent neurologists* and mental experts have emphasised the grave effect on the nervous system of noises which tend to increase the incidence of functional mental and nervous disorders in our midst, this meeting urges upon the People's League of Health the desirability of calling the attention of the Government to the need for the control and diminution of preventable noises in our streets, and asks that the subject shall receive the serious attention of the Ministry of Health.

A letter embodying this request has been forwarded to *the* Minister of Health, who has been asked to receive a *deputation consisting* of Sir Farquhar Buzzard, Sir Maurice Craig, Sir Robert Armstrong-Jones, Sir James Purves-Stewart, Dr. A. F. Tredgold, Prof. G. Robertson, and Dr. Thomas Beaton.

METROPOLITAN HOSPITAL SUNDAY FUND.—At a meeting of the Council of this Fund, which was held at the Mansion House on July *20th, it* was announced that the year's total collection amounted to £81,500. Of this sum £81,300 will be distributed among hospitals, institutions, dispensaries, and nursing associations of the metropolis. The collections in the churches and chapels this year were *£2000 in* excess of last year.

THE MERSEYSIDE HOSPITALS COUNCIL.—This is the name now adopted by the Hospitals Council of the Liverpool Penny-in-the-Pound Scheme—which has been revised and renamed. The body consists of the officers and life members, nominees of the voluntary medical institutions, the honorary medical staffs of the associated hospitals, representatives of organised labour, the employers' associations, the contributors, the local municipality and Boards of Guardians, the University of Liverpool, the British Medical Association, and the Health Insurance Committee. The income limit for manual workers has been abolished, but non-manual contributors, whose income exceeds the following limits, will *be unable to secure free vouchers for service at the associated* hospitals: single persons, £4 per week; married persons without families, £5 per week; married persons with families, £6 per week. Ministers of any place of worship contributing on Hospital Sunday will be entitled to recommend for a free letter of introduction to an associated hospital any member of their congregation who has not been in a financial position to contribute to the Penny-in-the-Pound fund. Full contributors' privileges will be extended to all genuinely unable to obtain work, and free letters of introduction will be issued to all cases so certified by the appropriate trade-union.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham.

MONDAY, July 30th.—2.30 to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY, August 1st.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE. Hammersmith, W.

MONDAY, July 30th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients.

TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Mr. Addison: Operations. 2 P.M., Dr. Shaw: Medical Out-patients.

WEDNESDAY, August 1st.—10 A.M., Dr. Owen: Medical Diseases of Children. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 2 P.M., Mr. Gibb: Eye Department.

THURSDAY.—10 A.M., Dr. Granger Stewart: Neurological *Department.* 2 P.M., Mr. Donald Armour: Operations. 2 P.M., Mr. MacDonald: Genito-Urinary Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 12 noon, Dr. Ironside: Clinical Demonstration. 2 P.M., Mr. Sinclair: Surgical Out-patients.

SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose and Ear Operations. 10 A.M., Dr. *Owen: Medical Diseases* of Children.

Daily 10 A.M. to 5 P.M., Saturdays 10 A.M. to 1 P.M., Medical, Surgical, and Special Departments. Operations, Anæsthetic Course, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W. 1.

MONDAY, July 30th, to SATURDAY, August 4th.—HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST (Brompton), Fulham-road, S.W. Special Course for one week. Fee £3 3s. Syllabus sent on request, as also those for Special Courses arranged *for* August to December inclusive.

Appointments.

COWELL, S. J., M.B., Ch.B. Camb., has been appointed to the *newly instituted* Chair of Dietetics, University of London.

GARLAND, H. G., M.B., Ch.B. Leeds, Demonstrator in Pathology and Bacteriology at the University of Leeds.

ROY, D. W., M.B., B.Ch. Cantab., F.R.C.S. Eng., Honorary Obstetric Surgeon to St. George's Hospital.

Westminster Hospital: MEACOCK, M. J., L.R.C.P. Lond., M.R.C.S., and SWABY, E. E., L.R.C.P. Lond., M.R.C.S., Resident House Surgeons. HOWELLS, J. M., L.R.C.P. Lond., M.R.C.S.; KENDALL, A. W., M.B., B.S., M.R.C.S. Lond., L.R.C.P., Resident House Physicians.

Certifying Surgeons under the Factory and Workshop Acts: CAMPBELL, A. M., M.B., Ch.B. Glasg. (Islay, Argyll); CAMPBELL, T. H., M.B., Ch.B. Glasg. (Wishaw, Lanark); MACKAY, R., M.B., Ch.B. Aberd. (Beauly, Inverness); and THOMAS, G. L., M.B., Ch.B. Glasg. (St. Margaret's Hope, Orkney).

Vacancies.

For further information refer to the advertisement columns.

Bangor, Carnarvonshire and Anglesey Infirmary.—H.S. £200.

Birmingham, Birmingham and Midland Ear and Throat Hospital. 2nd H.S. At rate of £150.

Birmingham, Queen's Hospital.—Dental H.S. At rate of £50. Also Res. Anæsthetist. £70.

Blackburn County Borough.—Asst. Dentist. £475.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.

Bootle, Bootle Borough Hospital, Derby-road.—Sen. M.O. Also 2 Jun. M.O.'s. Each at rate of £150 and £125 respectively.

Bradford, Bradford Royal Infirmary.—Two H.S.'s. £150.

Brighton, Royal Sussex County Hospital.—H.S. £150.

Cambridge, Addenbrooke's Hospital.—H.P. At rate of £130.

Cardiff, Cardiff Royal Infirmary.—Three H.S.'s, three H.P.'s, and H.S. Gynæcological. Each at rate of £50. Also H.S. Ophthalmic. At rate of £75.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. H.S. £100.

Chester County Mental Hospital.—Fourth Asst. M.O. £350.

City of London Hospital for Diseases of the Heart, &c., Victoria Park, E.—H. P. At rate of £100.

Coventry, Coventry and Warwickshire Hospital.—Res. H.P. £125.

Delhi, Lady Hardinge Medical College.—Woman Professor of Physiology. Rs.500 a month.

Exeter, Royal Devon and Exeter Hospital.—H.S. At rate of £130.

Hertford, Hertford County Hospital.—H.P. At rate of £150.

Liverpoo' [illegible] Chair of Pathology. £1200.

London [illegible] *le End, E.*—Assistantship in t [illegible] £400.

Manchester, Baguley Sanatorium.—Asst. M.O. £350.

Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Jun. Res. M.O. £100.

Newcastle-upon-Tyne, Wooley Sanatorium, near Hexham.—Asst. M.O. £350.

Newcastle-upon-Tyne, Hospital for Sick Children.—Hon. P. to Skin Dept.

Northampton, County Borough.—Asst. M.O. £600.

Richmond, Surrey, Royal Hospital.—Hon. Asst. Radiologist. Also Jun. H.S. £100.

Rotherham, Rotherham Hospital.—H.P. £180.

St. George's Hospital, Hyde Park Corner, S.W.—Pathologist and Lecturer in Pathology.

Scarborough, Scarborough Hospital and Dispensary.—Two H.S.'s. Each at rate of £126.

Society of Apothecaries of London.—Examiner in Midwifery.

Taunton, Taunton and Somerset Hospital.—Sen. House M.O. £150.

Wakefield, Clayton Hospital.—H.S. At rate of £150.

Wallasey, Victoria Central Hospital.—Jun. H.S. At rate of £100.

The Chief Inspector of Factories announces the following vacancies for Certifying Factory Surgeons: Melbourne (Derbyshire) and Poole (Dorsetshire).

Births, Marriages, and Deaths.

BIRTHS.

BALL.—On July 14th, at Crooms Hill, Greenwich, the wife of Dr. Norman D. Ball, of a daughter.

PENHALE.—On July 10th, at Moor House, West Bromwich, the wife of Dr. W. P. Pênhale, of a daughter.

DEATHS.

DURHAM.—On July 16th, Frederic Durham, M.B., F.R.C.S., aged 87.

HEYWOOD SMITH.—On July 21st, at Chichester, Heywood Smith, M.A., M.D. Oxon., aged 90 years.

MOLYNEUX.—On July 16th, after a short illness, Echlin Storry Molyneux, M.R.C.S., L.R.C.P., of Siddington, Leamington Spa.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. I., 1928.

THE Index and Title-page to Vol. I., 1928, which was completed with the issue of June 30th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Notes, Comments, and Abstracts.

RHEUMATIC DISEASES:

THE TREATMENT OF UNDERLYING INFECTION, INCLUDING VACCINES, THEIR USE AND ABUSE.*

BY SIR WILLIAM WILLCOX, K.C.I.E., C.B., C.M.G., M.D., F.R.C.P. LOND.,

PHYSICIAN TO ST. MARY'S HOSPITAL, W.; MEDICAL ADVISER TO THE HOME OFFICE.

THE rheumatic diseases under consideration comprise: (1) acute and subacute rheumatism—the so-called "rheumatic fever"; (2) infective rheumatism, which includes:—

(*a*) Acute infective arthritis.

(*b*) Non-articular manifestations of chronic rheumatism in which the fibrous tissues are involved, such as fasciæ, aponeuroses, tendons, ligaments, bursæ, perineural tissues, bones, and periosteum (Heberden's nodes), fibrous deposits or thickenings of connective tissue (finger-pads, &c.). The comprehensive term "*fibrositis*" may be regarded as including all of these manifestations.

(*c*) "*Chronic arthritis*," or all forms of chronic rheumatism in which chronic joint changes occur, such as osteoarthritis, arthritis deformans, rheumatoid arthritis, chronic villous arthritis, &c. Forms of arthritis and fibrositis due to specific infections such as gonorrhœa, dysentery, tuberculosis, syphilis, &c., are excluded from consideration.

It will be universally admitted that an underlying infection is a most important ætiological factor in the causation of the rheumatic diseases under consideration. In most cases it is the primary causative factor.

Other ætiological factors play a part in the causation of rheumatic disease, such as defective hygienic conditions, an inadequate and improperly balanced dietary, hereditary diathesis, and so on. These may act by reducing the body resistance to infection, and they may predispose to the establishment of the underlying infection in the body.

The joint and connective tissue disorders which characterise rheumatic disease, whether it be rheumatic fever or one of the forms of chronic rheumatism, are not diseases per se, but are the local manifestations of the toxæmia of an underlying infection.

The proof of this statement is to be found in the other coexistent evidences of disease which accompany the rheumatic symptoms. Thus, in acute and subacute rheumatism, as was pointed out by the late Dr. W. B. Cheadle, the late Dr. David Lees, and Sir Thomas Barlow over 30 years ago, the joint symptoms are the least important part of the disease. Much graver manifestations of the disease were the heart complications such as pericarditis, myocarditis, endocarditis, the lung complications such as pleurisy and pneumonia, and the nervous complications such as chorea.

In chronic rheumatism, if carefully looked for, one always finds other evidence of the toxæmia besides the purely rheumatic symptoms, thus, a secondary anæmia is almost always present, and is accompanied by a general impairment of health, gastro-intestinal disorders, and other evidences of a toxæmia affecting different parts of the body.

(1) *Acute and Subacute Rheumatism.*

In childhood and pre-adult life the channel of the underlying infection appears to be the nasopharyngeal tract. Unhealthy tonsils are commonly found in the first attacks, and much evidence has been accumulated in recent years to prove the important part which infected tonsils play in the causation of acute and subacute rheumatism.

It has been my experience of hospital practice that one does not meet, to anything like the same extent to-day, with the virulent cases of rheumatic fever in children which were so common 30 years ago. Rheumatic hyperpyrexia rarely occurs at the present time, and the very severe cases of rheumatic fever in children are, I believe, much less common than formerly.

In my opinion, this improvement is largely due to the development of school hygiene and the medical supervision of children attending the elementary schools, whereby unhealthy conditions of the nasopharynx are recognised and receive, where necessary, appropriate medical and surgical treatment.

The improved sanitary conditions of houses, drainage, &c., and the care taken in refuse removal and disposal have also no doubt, played a part in reducing exposure to infection.

In acute and subacute rheumatism occurring in children during the pyrexial period, no special treatment is indicated for the underlying infection beyond the local treatment for existing nasopharyngeal conditions, and the usual treatment with salicylates.

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* A paper read at the Bath Conference on Rheumatic Diseases.

When the acute condition has subsided, and, provided that no cardiac or other complications contra-indicate, it is most important that any diseased condition of the nasopharynx should receive appropriate treatment. Thus unhealthy tonsils and adenoid tissue should be removed, and any disease of the accessory nasal sinuses should receive attention. The stumps of tonsils that have been imperfectly removed are often foci of infection, and may be responsible for recurring rheumatic attacks. These, if present, should receive careful examination, and be removed if found unhealthy.

When any gross focus of infection has undergone removal as far as possible, no further special treatment of the underlying infection is necessary if the patient remains in good health.

It must be remembered that other foci of infection exist in the nasopharynx besides the tonsils and accessory nasal sinuses, thus the whole of this surface area contains tubular glands which secrete mucus as one of their functions, and the submucous region contains numerous collections of lymphoid tissue.

The recurrence of acute and subacute rheumatism in children in whom the tonsils and adenoids have been efficiently removed is due, I believe, to a persisting infection in these glands and lymphoid collections. Surgical treatment is impossible in such cases, and vaccine treatment may be of value, in addition to local treatment by sprays, vapours, and gargles, &c.

Should rheumatic symptoms still recur in cases in which unhealthy tonsils and adenoids are not present, it is advisable for a swab of the nasopharyngeal area to be taken and bacteriologically examined. If a definite infection with a pathogenic streptococcus is found, vaccine treatment is often of value.

It must be remembered that streptococci of nasopharyngeal origin are often very toxic in character. It is, therefore, advisable to give only small doses of an autogenous vaccine of this type. A weak vaccine such as 2,000,000 per c.cm. may be prepared, and a graduated course of inoculations given in doses of 2, 3, 4, 5 minims at intervals of five days, and then weekly doses, the dose being increased by 1 minim weekly for three months.

It has been my experience that much better results are gained by the use of autogenous vaccines than with stock vaccine prepared from other cases.

In acute and subacute rheumatism *affecting adults*, often other foci of infection than the nasopharynx play a part.

Secondary infections of the intestinal tract are commonly present, and also the dental region is liable to infection.

In such cases a careful examination should be made for secondary foci of infection in other regions than the nasopharynx, and these should receive appropriate treatment.

Thus, infected teeth should be removed at such time as this can be safely effected. Intestinal infections may be treated advantageously by Plombières douches, colon irrigations, &c.

Bacteriological examination of the urine, &c., should be made, and any existing infection of the urogenital tract receive suitable treatment.

In the acute stage of rheumatic fever, whether in children or adults, vaccine treatment in my experience should be entirely avoided.

The use of salicylates in full doses, combined with appropriate alkali-producing drugs, is the safest and best remedy in this stage. Often where response to treatment is not immediate, an increase in the dosage of sodium salicylate brings about a cessation of the acute symptoms. In this procedure care is taken that symptoms of acidosis are not present, and that acetone and diacetic acid are absent from the urine.

In exceptional cases of true acute rheumatism in adults, where response to salicylate treatment is tardy, antistreptococcus serum of appropriate type may be given. It is wise that the initial dose should be quite small—e.g., 5 c.cm. subcutaneously. If no unpleasant symptoms result from this, a dose of 20 c.cm. may be given in six hours, and this may be followed by two or three further doses of 20 c.cm. at intervals of 24 hours respectively. Any danger from anaphylactic shock is avoided by giving the preliminary small dose. Serum should never be given if there is any danger of anaphylaxis, and is, therefore, avoided where a patient has had, on previous occasions, animal serum administered subcutaneously.

After a course of antistreptococcic serum has been given, no further doses are permissible, since, after an interval of a few days there would be danger of anaphylactic shock should any doses be repeated.

In adults there may be a tendency for the recurrence of acute and subacute rheumatism in spite of the adequate treatment of gross foci of infection, and of other therapeutic measures, such as medicinal and spa treatment.

In such cases it is advisable to carry out bacteriological investigations of a nasopharyngeal swab, stools, and intestinal washings, and the urine (catheter specimen). Usually a pathogenic streptococcal infection is found.

A course of vaccine treatment with an autogenous vaccine made of the pathogenic streptococci from the various sources is sometimes beneficial.

It is advisable to use a vaccine of weak strength, such as 5,000,000 per c.cm. for a preliminary course, giving doses such as 2, 3, 4, 5 minims at intervals of five days respectively, and afterwards weekly inoculations, the dose being increased by 1 minim each week.

If this course gives good results a further course of inoculations with a stronger vaccine (50,000,000 per c.cm.) may be given in weekly doses of 2, 3, 4, 5, 6, 7, 8, 9, 10 minims respectively.

Contra-indications to vaccine treatment in adult cases would be the presence of any existing gross focus of infection which could be removed with advantage, such as septic tonsils or septic teeth, also any evidence of sensitisation such as the occurrence of gout, urticarial eruptions or prurigo, angioneurotic œdema, asthma, &c.

(2) *Infective Rheumatism.*

(*a*) *Acute Infective Arthritis.*—The great majority of cases of infective rheumatism are of the chronic type. Sometimes, however, acute cases occur in which there is evidence of an acute toxæmia, such as marked and continued pyrexia, and definite symptoms of acute arthritis or fibrositis.

Complete rest is the first essential.

A careful investigation should be made to discover the presence of any foci of infection. In cases of this type an active infection always exists, and the most judicial consideration is necessary before active measures are taken for dealing with any removable foci.

When infected teeth are the cause of acute toxæmia and infective arthritis, it is usually advisable and necessary to remove these in the acute stage of the illness.

One of many similar cases that have been under my care may be quoted :—

The patient, male, aged 57, seen May 26th, 1925, had suffered for six weeks from painful and tender swelling of the joints, both hands and wrists. The right knee was swollen and painful, fluid being present in the joint. The elbows and shoulders were painful. The temperature had ranged from 100° to 103° F. for the whole period. There was no history of rheumatic fever, and the condition did not respond in the least to salicylates.

An autogenous streptococcal vaccine, and antistreptococcal serum had been tried without benefit.

An X ray examination of the teeth showed the presence of periodontitis, but no apical infection was present. No other focus of infection was present. Sir Frank Colyer saw this patient in consultation with me, and was of opinion that an acute periodontitis was present.

Removal of the remaining 15 teeth was decided upon. The condition of the patient was so serious that a general anæsthetic was unsafe. The teeth were removed three at a time under local anæsthesia, an interval of 10 days being allowed between the respective extractions.

It was necessary for all the teeth to be removed, since not until then did the pyrexia completely subside and the swelling of the joints disappear. This patient has remained quite well since his illness, and the joints have been normal.

In conditions of acute toxæmia and infective arthritis due to septic tonsils, removal of the tonsils in the acute stage of illness is impossible owing to the grave risk that would be involved of local sepsis or of acute streptococcal septicæmia.

In such cases large doses of antistreptococcal serum are of value. They should be given with the precautions already described.

When the acute toxæmia has subsided and the temperature has remained normal for a few weeks, the removal of the tonsils will usually be advisable owing to the risk of development of chronic rheumatism.

A case of acute toxæmia and infective arthritis due to acute pharyngitis has recently been under my care in St. Mary's Hospital.

The patient, male, aged 28, was taken ill with pyrexia on Nov. 25th, 1927, acute pain and swelling of the joints of the hands, wrists, knees, and ankles occurred, there were pain and limitation of movement of the hip- and shoulder-joints. The pharynx was red and inflamed. The temperature ranged from 99° to 101° F. for five weeks.

There was no history of rheumatic fever, and the condition did not respond to large doses of salicylates.

X ray examination of the teeth showed nothing abnormal. My colleague, Mr. W. H. Dolamore, found the teeth healthy on clinical examination. The tonsils and accessory nasal sinuses were found free from sepsis by my colleague Mr. Cecil Graham.

There was no evidence of urogenital infection. Bacteriological examination of the stools and urine gave a normal result. A marked infection with *Streptococcus viridans* was found in the pharyngeal swab, and an autogenous vaccine of strength 5,000,000 per c.cm. was prepared. On Dec. 22nd, 23rd, and 24th doses of 20 c.cm. antistreptococcal serum were given. On Dec. 28th the temperature fell to normal. On Dec. 29th vaccine treatment was commenced, doses 1, 2, 3 minims being given at five-day intervals respectively, and afterwards weekly doses, the dose being increased by 1 minim each week.

On Jan. 14th the symptoms of pain and swelling of the joints had cleared up and the patient was discharged from hospital on Feb. 2nd, 1928, his joints and general condition being quite normal. The patient has resumed his work as chauffeur, and has been entirely free from any rheumatic symptoms.

"*Acute infective arthritis*" is really an acute toxæmia with acute arthritis as one of its manifestations. When recovery occurs from the acute toxæmia it is remarkable in many cases how completely the acute arthritis clears up, the joints becoming quite normal.

(*b*) *Chronic Rheumatism.*—In practically all cases of chronic fibrositis and chronic arthritis an underlying infection is present.

Careful search for the focus or foci of infection is the first step in treatment, and it is of the utmost importance that the relative significance of the various causal foci is appreciated when several are present. Sometimes the clinical symptoms are a guide. Thus, in cases of tonsillar and nasopharyngeal origin, there is a greater tendency for effusion into joints and tendon sheaths rather than for actual bony changes to occur. The joint symptoms may clear up to some extent and the improvement be followed by recurrences of the arthritis.

The tonsillar cases are more often seen in young people and are more likely to be associated with pyrexial periods.

Cases of intestinal origin are often associated with Heberden's nodes, and with bony changes and synovial proliferation—e.g., osteoarthritis and villous arthritis. The complexion is often sallow and a secondary anæmia is common. The colon is atonic and large, flatulent abdominal distension being present. The urine commonly contains a large excess of indican.

A careful clinical examination of the teeth, nasopharynx, gastro-intestinal tract, urogenital tract, should be supplemented by an X ray examination of the teeth and accessory nasal sinuses.

In some cases an X ray examination of the alimentary tract is advisable where diverticulitis, chronic appendicitis, cholecystitis, or intestinal stasis are suspected.

Bacteriological examination of the nasopharyngeal swab is of great value, since in the great majority of cases the causal organism is found in that region, often in almost pure culture. The teeth, tonsils, and antral discharges should be bacteriologically examined when operative measures have been carried out.

Bacteriological examination of the stools and also of the colon washings after an irrigation with normal saline are of value. In over 90 per cent. of cases of chronic arthritis under my care a streptococcus of the viridans group has been found in the stools. The streptococcal infection is, no doubt, in most cases secondary to a pre-existing dental or nasopharyngeal infection.

Search should be made for the non-lactose fermenting group of coliform organisms. These are known as the "parenteric group," and include *Bacillus asiaticus* and pseudo asiaticus, *Bacillus fæcalis alkaligenes* and pseudo fæcalis alkaligenes, bacillus of epidemic jaundice, bacillus morgan, the food poisoning group, such as *Bacillus aertrycke*, *Bacillus enteritidis* of Gaertner, &c.

I have found a parenteric intestinal infection associated with the streptococcal infection in an appreciable number of cases of chronic rheumatism, and I believe that this plays a part, perhaps a minor one, in the ætiology of these cases.

The combination of a streptococcus infection with a parenteric infection in the bowel may produce an enhanced pathological effect by symbiotic action. The close association and resemblance of the parenteric organisms with the bacillary dysentery group (which are well known to cause arthritis) is sufficient to call for careful attention.

Where a prostatic cause is suspected, prostatic massage is advisable before collecting a sample of urine for bacteriological examination.

Swabs from the vagina, cervix uteri, or uterus may require bacteriological examination if clinical symptoms suggest it.

In almost all cases of chronic rheumatism investigated in the bacteriological department of St. Mary's Hospital a streptococcus of the viridans group has been found, and this is sometimes accompanied by a hæmolytic streptococcus. The streptococcal organism must, I think, be regarded as the one usually responsible for the underlying infection.

The treatment of the underlying infection in chronic cases involves:—

1. Removal of gross foci of infection where this can be undertaken without risk or harm. Teeth showing periapical bone necrosis must be removed.

2. Where there is marked periodontal disease, or where dead teeth, or stumps, are present, or unerupted teeth, or dental cysts showing evidence of infection, careful consideration must be given to the question of radical surgical treatment.

3. When the rheumatic trouble is of a serious type, and where the evidence points to there being an important factor in causation, it is advisable for radical treatment to be carried out.

The proper procedure is, I think, to treat each case on its merits, and to arrive at a decision after considering all the points for and against surgical treatment. No hard-and-fast rules can be laid down for all cases.

The question of surgical treatment of unhealthy tonsils or tonsillar stumps must receive careful consideration. It should be carried out where the clinical type of the disease points to these as the causal factor. Where the rheumatic trouble is serious and persistent and no other important cause is found the indication for surgical treatment is strong and well founded.

Infected maxillary antra require adequate drainage by surgical measures, and infected accessory nasal sinuses may call for operative treatment.

Unhealthy conditions of the colon call for suitable treatment by means of special diet, Plombières douches, colon irrigations, or abdominal massage, &c.

The *underlying infection* can be further treated by measures taken which will raise the immunity of the body, thus *general measures* are of value such as suitable climatic conditions, artificial sunlight, a dietary which is well balanced and rich in nutritive vitamin-containing foods, the supplementing of endocrine deficiencies by administration of suitable doses of thyroid gland, &c.

Special Biological Measures.

Vaccine therapy.—Vaccines should not be given until the case has received the fullest clinical investigation, and any existing foci of infection received appropriate treatment.

An abuse of vaccine therapy is the administration of vaccines to cases of chronic rheumatism where obvious foci of infection are present—for example, septic teeth, septic tonsils, or infected antra. In such cases more harm than good must result.

Vaccines cannot raise the immunity where gross septic foci exist such as these, and they are likely to cause severe reactions and possibly complications such as urticarial eruptions, prurigo, &c.

Vaccines are contra-indicated where "sensitisation" to the toxins from the infection exists. Examples of this are recurring urticarial eruptions, prurigo, certain erythemata, gout, angioneurotic œdema.

In exophthalmic goitre, if associated with chronic rheumatism, vaccines may increase the symptoms of the thyroid disturbance and should be avoided. If nephritis is present, vaccines may cause an exacerbation of the renal symptoms and are dangerous.

If retinal vascular lesions of toxic origin are present in association with chronic rheumatism vaccine treatment is best avoided owing to the risk of further retinal damage.

Vaccines are of value in cases of chronic rheumatism where any gross focus of infection has been removed and where the toxic process is being carried on by the chronic infection of a mucous surface with its accompanying glandular tissue. Thus, in chronic intestinal or nasopharyngeal infections vaccine treatment may be used to supplement the other measures.

Complete bacteriological examination should be made of all the possible channels of infection and an autogenous vaccine prepared. This is usually one composed of streptococcal organism of the viridans group. The streptococci from different foci may with advantage be combined in suitable proportions.

For reasons already quoted it is advisable to commence with a vaccine of weak strength, say 5,000,000 per c.cm., and, after a preliminary course of this, to proceed with a stronger vaccine of, say, 50,000,000 per c.cm., giving carefully graduated doses. By this method of procedure unpleasant reactions are obviated, and the occurrence of harmful complications is guarded against.

Any evidence of symptoms of sensitisation are an indication for discontinuance of this line of treatment. In my experience effective immunisation is more readily obtained by carefully graduated doses of a weak vaccine than by giving the large doses advocated by some.

Where a parenteric intestinal infection exists in company with the streptococcal, and when a positive agglutination test is given by the patient's blood serum and the organism found, it is often advisable to give a short course of inoculations with the autogenous parenteric vaccine. This may be made of strength 50,000,000 per c.cm., and weekly doses of 2, 4, 6, 8, 10 minims given.

At the end of this course a further bacteriological examination of the stools should be made to determine if the infection still persists.

Stock streptococcal vaccines made from other patients are, in my experience, far inferior to autogenous vaccines, and are not recommended for use.

Antistreptococcal serum is not indicated in cases of chronic rheumatism.

Protein shock therapy, such as injection of peptone solution or of typhoid vaccine has, in my experience, been disappointing. In some cases, definite temporary improvement has occurred, but this has often been followed by a relapse into the former condition.

The Action of Vaccines in Chronic Rheumatism.

Properly graduated doses of an autogenous vaccine are of value in raising the immunity of the body to the causal toxæmia, and they, therefore, promote an improvement in the general condition of health.

The effect of an inoculation is to cause some local reaction in the affected joint. The increase in blood-supply consequent on this has a beneficial local effect. Vaccines are undoubtedly helpful in promoting absorption of inflammatory exudates. It cannot be claimed that they will effect improvement in the bony changes which have occurred in a damaged joint.

In some cases, such as old-standing osteoarthritis of the hip, vaccine treatment is undoubtedly of value in relieving pain and in checking the progress of the arthritis.

Vaccine treatment can with advantage be combined with other methods of treatment.

A BABIES CLUB.

AN infant welfare centre on a self-supporting basis has been opened at Stanley Cottage 35, Danvers-street, Paulton's-square, Chelsea. Dr. W. H. L. McCarthy, medical officer of health for Chelsea, is on the committee of management, and Dr. Harold Waller is medical officer to the centre. The object of this "Babies Club" is the instruction in the hygienic management of young children of mothers of the professional class who cannot afford repeatedly to call in a doctor for purposes of general supervision. Any mother wishing to bring her child to the club must first inform her family doctor of her intention and obtain his coöperation. Cases of illness discovered at the club will be referred back to him. Subscribers are not at liberty to ask the medical officer to attend their children in case of illness in their own homes; he can do so only at the request of their own doctor. Home visits by the nurse-superintendent are, however, covered by the subscription. The fee payable is five guineas per child for one year, or seven and a half guineas for two children in one family. The estimated expense of running the club is £750 per annum, and the estimated annual income, on the basis of one clinic a week and 150 members, is £787. There has been a steady increase in numbers since the club was opened in November last. The capital necessary to start the venture was provided from private loans, on which 5 per cent. income is to be paid if funds permit; it is hoped to repay the loans out of the funds of the club. £300 is still required for equipment and running expenses until the full complement of members is reached.

THE QUEEN'S NURSES IN IRELAND.

FOR some months past there has been anxiety among those interested in the admirable work of the Queen's nurses (better known as Jubilee nurses) in Ireland. Since the institution was founded about 40 years ago for the nursing of the sick poor in their own homes, the nurses in Ireland have been under the control of a Central Council meeting in Dublin, which was subordinate only to the Executive in London. All parts of Ireland have been represented on the Central Council, and no complaint has ever been made that partiality was shown toward one district rather than another. A few months ago, however, a sum of money raised in Northern Ireland to found a memorial to Queen Alexandra was offered to the Belfast Advisory Committee to extend the work of the nurses in Northern Ireland, on condition that a Council should be established for Northern Ireland entirely independent of the existing Council for Ireland. The proposal, warmly championed by Lady Londonderry, was opposed throughout the greater part of Ireland, and nowhere more determinedly than in some of the counties of Northern Ireland. After considerable controversy the proposal came before the Executive in London, which appointed a subcommittee, under the chairmanship of Sir William Hale-White, to inquire into the matter. The subcommittee took evidence in favour of and against the proposal, and has now reported against it. In the opinion of the subcommittee no one in the Irish Free State favoured the proposal, and many in Northern Ireland disliked it. The large majority of those interested in the work of the nurses in Ireland were definitely against shou[illegible]nge. Moreover, the size of Northern Ireland would In adultsr the unnecessary expense of a Council, with a [illegible] and suuaining establishment. The subcommittee has not justi[illegible] of groaggestions in the endeavour to meet specific offices and [illegible]ch as by Lady Londonderry and her friends, made certain s[illegible] criticisms made [illegible] hoping thereby to prevent any injury being done to the work of the nurses, which is universally appreciated. This will be the hope of many in Ireland who do not see why political divisions should be permitted to interfere with charitable activity.

ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the committee 37 applications for assistance were considered, and £520 16s. voted to 32 cases. As the holiday season approaches appeals come from widows and others asking for help towards the holiday expenses for children of medical men. An appeal is made to all who sympathise with the children's need during the summer holidays, to support this work of the Fund by sending subscriptions to the hon. treasurer, 11, Chandos-street, Cavendish-square, London, W. 1. The two following cases are quoted as an example:—

Mrs. X, whose husband, M.B. Lond., is now in a mental home as a free patient, has charge of three children. She has no income other than what she can make by needlework. The eldest child, a girl of 12, is educated by her godmother. The Fund pays the school fees for the son, age 9; the third child is at home. The applicant writes: "I had a breakdown in the middle of April and have been able to do so little work since that the seven weeks' summer holidays is rather a nightmare to me as regards finance." A grant of £7 10s. was voted.

M.R.C.S. who died in 1921, leaving five children, ages 12 to 4. One is at Epsom College, one at a girl's school, and three at orphanages. These children are dependent on relatives who are unable to contribute. Fund voted £15 for the children's holidays.

Other cases helped were:—

L.M.S.S.A. at the age of 70, who was in practice for 21 years, broke down in health in 1920. Ill health and ill luck followed each other. He is suffering from bronchitis and diabetes, and unable to work. He is entirely without means except the 15s. a week which his wife is able to make as a cook-housekeeper in some service flats. Voted £40.

L.R.C.P. & S., aged 72. The applicant is a widower, nearly blind with diabetes, and is confined to his bed. His income is the Old Age Pension £26 and Epsom Pension £40. Fund granted £25, making his total income £91; his rent for his room is £26.

L.R.C.P. & S. Edin., aged 68, whose wife is delicate, aged 66, had to give up his regular practice 24 years ago, since when he has worked as locum tenens. He has been handicapped by ill health, and during the last nine months has been unable to work and got into financial difficulties. Voted £40.

L.R.C.P. &. S., died in 1926 at the age of 39, leaving a widow and two infants ill provided for. The fund assisted the widow in 1927. In May, 1928, the widow died, leaving the two orphans, aged 8½ and 7½. Assistance was asked from the Fund. The case has been handed over to our Ladies' Guild to administer.

THE WELLCOME HISTORICAL MEDICAL MUSEUM.

THE souvenir programme issued in connexion with the visit paid by the African Society on July 11th to the Wellcome Historical Medical Museum takes the form of an attractive little book. This contains an illustrated catalogue, and an account of the inauguration ceremony in 1913, and of the speeches on Oct. 14th, 1926, when the reorganised and extended museum was reopened by Sir Humphry Rolleston. This is one of the permanent exhibitions in London that deserve a visit from doctors. The hall of primitive medicine and the alchemy room will appeal especially to those interested in ancient superstitions, while the development of pharmacy is neatly shown in the models of the chemist shops of different ages. Specimens, pictures, and statues are displayed in other rooms. The museum is at 54A, Wigmore-street, London, W.

A CONVENIENT HÆMOGLOBIN CHART.

WE have received from Messrs. Reed and Carnrick a handy hæmoglobin chart, which consists of a cardboard disc pinned by a paper clip to several layers of blotting-paper of larger diameter. These layers are separated from each other by grease-proof paper. The disc is divided into seven sectors of varying tints of red. If a drop of blood is placed on the filter paper, the chart may be rotated while the blood is still moist, until the colour is matched by one of the sectors which are numbered 10, 30, 50, 70, 80, 90, and 100, indicating the hæmoglobin percentage represented. When the first piece of blotting paper has been used it can be thrown away, and the next lower used when occasion demands. As a simple hæmoglobinometer this chart should be quite useful. It is unfortunate that the letterpress describing its mechanism claims rather too much. The suggestion is that the presence of mild, moderate, or severe anæmia can be determined merely by consulting the chart, whereas, of course, it is not so much the percentage of hæmoglobin, but the colour-index, which is the relation of hæmoglobin to the number of corpuscles in the blood to be tested, that gives a valuable indication of the type and degree of anæmia in any subject. There is no reason, however, why this hæmoglobinometer should not be as useful as more complex ones, provided it is not expected to take the place of a red cell count.

An Address

ON THE

PIDEMIOLOGY OF CHILDREN'S INFECTIOUS DISEASES.*

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. NOTABLE change has taken place during recent rs in the conception of epidemic diseases, a change ch is of importance not only from a theoretical also from a practical point of view. The classical ohylaxis of epidemic diseases has been established he basis of the doctrine of Robert Koch, that the aogenic microbes are *only* to be found in those ases which they have caused, while in healthy ple they are either absent or found only as an eption. A sharp line can be drawn between these aogenic microbes and the group of saprophytes, ch, lacking any specificity, are found on the skin in the mucous membranes of any person. The lern doctrine holds that between pathogenic robes and saprophytes there is only an artificial ntitative distinction. We know that in a con-rable number of diseases the causative microbes pathogenic only for a very limited number of aan beings, and are but inoffensive saprophytes the majority. Infection is therefore not identical a infectious disease, save in a very few cases. We e to differentiate between infection followed by ease and infection without disease. The latter can called "latent infection" and, in its propagation, tent epidemisation" ("latente Durchseuchung"). s easy to understand that the extent of "latent lemisation" is of the utmost importance for ventive measures. We must therefore get an ct idea of the extent of the latent epidemisation each infectious disease. In an extensive latent lemisation we may assume the following two ors: (1) a very small inborn susceptibility of ividuals to the contagious disease; (2) an extensive ead of the specific microbes. The first statement s not need any interpretation. If the microbe is virulent for man that infection coincides with the aptoms of disease, we experience a manifest, not tent epidemisation—for example, measles.

Latent Immunisation.

he spread of microbes depends upon the manner their excretion. The latter is of the greatest oortance in diseases conveyed through droplet ection, and in these latent epidemisation plays an oortant part. The practical importance of latent demisation lies not only in the prophylaxis of demics, but also in a phenomenon which I call tent immunisation." Latent infection, as well as overy from an infectious disease, may confer ting immunity. In a large population latent munisation must naturally be a function of age. e older an individual the more frequently he has en exposed to latent infection, and the higher erefore is his degree of latent immunisation.

We have known for a long time that the insuscepti-ity of adults to measles is due to the fact that almost eryone gets over them in youth. During the asles epidemic on the Faroë Isles, all the inhabitants, espective of age, were afflicted. Such an explana-n is impossible for acute poliomyelitis, diphtheria, d scarlet fever. Since the number of children who ntract these diseases is comparatively small, it is ficult to understand the immunity of adults. The planation is that latent epidemisation takes the ice of the disease. The immunity of adults towards ildren's infectious diseases is not inborn but is the result of latent epidemisation. The restriction of certain infectious diseases to the period of infancy is explained by the enormous extent of manifest or latent epidemisation in these diseases. Since this extent depends on the method of propagation of the microbes, it is not an accident that all infectious children's diseases are spread by means of droplet infection, whereas infectious intestinal diseases are not restricted exclusively to infancy. The relative resistance of adults towards the saprophytes of the mucous membranes of the upper respiratory tracts—the streptococci and pneumococci—is acquired by latent epidemisation. Among primitive races and people living far from civilisation very dangerous contagious diseases are caused by these organisms—e.g., pneumonia among the negroes in the mines of the Transvaal and the black workmen of the Panama Canal, and, during the war, among American soldiers recruited from country districts. The infant responds to an infection like an individual of *a primitive race.* The malignancy of measles in children under three does not depend upon the virus itself but upon the mixed infection with streptococci, which causes severe septic and contagious bronchial pneumonias. The course taken by children's infectious diseases is often dominated by these mixed infections. The numerous trifling infections which take place during childhood confer an immunity to pneumococci and streptococci, transforming them in the adult into inoffensive saprophytes.

We have at our disposal four methods for the study of infectious diseases: (1) bacteriological analysis; (2) immunity reactions, such as the Schick test in diphtheria and the Dick test in scarlatina; (3) the epidemiological method (statistics); (4) the methods of experimental epidemiology—the newest method taken by epidemiological science. This development we owe to the studies of Topley in England, and of Flexner, Amoss, and Webster in U.S.A.

ACUTE POLIOMYELITIS.

Acute poliomyelitis, which lately has attracted especial interest, shows the strongly marked characteristics of children's infectious diseases. In 1840 the German physician Heine was the first to outline the pathography of poliomyelitis as an *entity.* At that time only a few cases had been recorded, and nobody thought that the disease was contagious. In 1895 Medine referred to an epidemic in Sweden; there were only 43 cases. In 1905 a second epidemic of 1000 cases occurred in Sweden, and soon spread all over Norway, Germany, Austria, and America. Since that time poliomyelitis has never completely disappeared. It was not, however, until 1910 that it rose to a pandemic of considerable proportions, which lasted three years in Sweden and affected 10,000 persons. This outbreak was followed by the spread of the disease almost all over the world. In Germany we have noticed an increase in the number of cases, and it may be that we are on the eve of a new outbreak.

Poliomyelitis epidemics follow a very characteristic course. The spread of most contagious diseases is favoured by communication and has a direct connexion with the density of population. Poliomyelitis especially affects lonely and remote districts. The fact that the majority of cases are isolated and have no obvious connexion with other cases seemed to contradict the contagiousness of the disease, but during epidemics the contagiousness rises considerably. During the Swedish epidemic of 1910–1913, according to Wernstedt, 18·6 per cent. of the cases were group cases in one house, while 38 per cent. were caused by infection in hospitals. On account of these peculiarities poliomyelitis has been held for a long time to be infectious, but not contagious. Some authors supposed that the virus lived in the earth, and thus explained the spread of the disease in country districts. Others thought that it was propagated by insects. This opinion was supported by the seasonal incidence curve. While most children's diseases have their annual maximum in the autumn, poliomyelitis is a summer disease, at its maximum in July and

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* Delivered in London at the invitation of the Health Organi-ion of the League of Nations at an International Course for dical Officers of Health.

August. But as in winter epidemics the number of cases is considerable, we must exclude an exclusive or prevailing participation of insects in the propagation of the disease. The opinion that poliomyelitis is a primary disease of domestic animals is without foundation.

It was a valuable advance when Wickmann laid all these doubts at rest and proved, by an exact cartographic study of the Swedish epidemic of 1905, the contagious character of the disease. The epidemic arose from isolated centres scattered all over the country, but the cases showed a pronounced group-formation round these first centres, from which they afterwards spread in a radiate form, following the trade routes. It was Wickmann who made the important observation that connexion between the single cases could often be traced through abortive cases without palsies.

Remaining contradictions were solved by Wernstedt's epidemiological studies during the Swedish epidemic of 1910–1913. When Wernstedt, following the example of Wickmann, made an exact cartographic note of the cases of this epidemic, he was surprised to discover that all the districts where cases of poliomyelitis had occurred in 1905 were free from infection during the epidemic of 1910. Sometimes these districts were quite surrounded by the epidemic, and were therefore proved to be immune. This immunity could only be due to the epidemic of 1905, but this fact is difficult to explain. Poliomyelitis, though it travels through countries at a rapid rate, affects few individuals in each country. For instance, the cases in the districts visited by the epidemic of 1905 numbered but 1 to 2 per cent. of the population; nevertheless, the whole population had become immune. The entire population must, therefore, have come in close contact with the microbe without being affected. This, then, is the first example of an extensive latent epidemisation. The hypothesis of latent epidemisation readily explains the other peculiarities of the epidemiology of poliomyelitis, including: (1) the dependence of the spread upon the density of population; (2) the incidence of the epidemic at different ages.

The more congested the population of a district and the more active its communication with its neighbours, the easier is the spread of the ubiquitous poliomyelitis virus in the intervals between epidemics, and the more readily will it latently infect and immunise the population. On the other hand, the population of remote districts is deprived of this preventive effect and is therefore much more exposed to infection. The frequency of group cases in a household will be the higher the greater the number of susceptible persons united under the same roof. Table I. demonstrates this:—

TABLE I.

Size of town.	Incidence-rate (per cent.).
More than 100,000 inhabitants	8·8
100,000 to 10,000 inhabitants	9·4
Country town, less than 10,000 inhabitants ..	13
Country	20·7

Poliomyelitis is generally considered to be essentially a disease of the earlier years of life, but its age-incidence depends also in a very characteristic manner upon conditions of local distribution and traffic. If the population is not dense and communications not developed, poliomyelitis ceases to be a children's disease and more adults are affected. This will be seen from Table II. and Fig. 1.

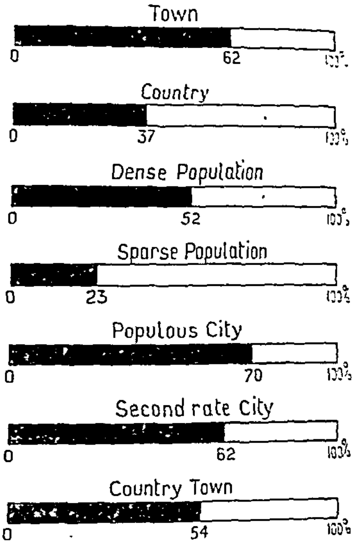
TABLE II.

Age-group.	Town.	Country districts.	Population.		Populous city.	Small town.	Country town.
			Dense.	Sparse.			
	%	%	%	%	%	%	%
Years 0–5	61·8	37·5	51·8	23·0	70	61·8	54·2
Over 6 ..	38·2	62·5	48·2	77·0	30	38·2	45·8

In districts where the poliomyelitis virus has little or no opportunity to spread, there is a high susceptibility among adults. The more the population is exposed to the virus, the more is the susceptibility restricted to the earliest years of life. Should this hypothesis prove to be correct, there should be no difference in susceptibility between young and old where poliomyelitis is imported into a population that has never been in contact with it before. A. Müller has reported an outbreak of poliomyelitis on a Pacific island, during which 37 per cent. of the natives were affected, and the maximum incidence was between the ages of 12 and 40.

I have restricted myself to the Swedish epidemics, because their epidemiological laws have been the most thoroughly studied. These significant results have been obtained from epidemiological statistics alone.

FIG. 1.



Age-incidence of poliomyelitis in different districts. The black rectangles represent the age-groups from 0–5 years, the white rectangles the ages over 6 years.

Ætiological Investigations.

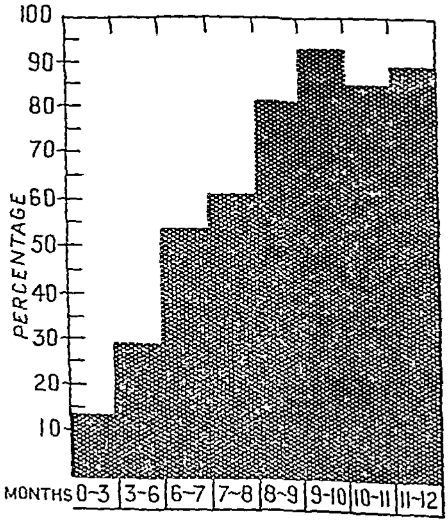
To Landsteiner, Levaditi, Flexner, Wiesner, Römer, and others we owe the discovery that poliomyelitis may be transmitted to the lower monkeys by subdural inoculation of the brain and spinal cord of poliomyelitis cases. Flexner and Amoss were able to prove by experiments the highly important epidemiological fact that the virus is also to be found in the nasal secretion of the infected animals, and that infection could be induced by dropping the virus on the intact mucous membrane of the nose.. These results suggest that in man the mucous membrane of the nose is the most important portal of entry as well as the chief path of elimination of the virus, and we may further suppose that case-to-case infection takes place by droplet infection. This statement is in harmony with existing epidemiological conceptions. Kling and Wernstedt have demonstrated the poliomyelitis virus in the nasal secretion of man, but it is doubtful whether this is the only mode of virus transmission. Since in the beginning of poliomyelitis diarrhœas are not rare, it is plausible that the virus may be excreted in the fæces. Flexner and Amoss have found it in the excreta of monkeys, but droplet infection is in all probability the more important factor, because in this way the virus gains a far wider propagation. Spontaneous fluctuations of virulence observed in poliomyelitis virus by Flexner and Amoss are of great interest and may lead to an explanation of the coming and going of epidemics.

DIPHTHERIA.

This disease attracts especial attention nowadays because there are signs of a threatening increase in several capitals. such as Paris, Budapest, and Berlin. Since 1926 the number of cases in Berlin has doubled. Far more alarming, however, is the malignant character suddenly taken by this disease. Whereas the percentage of diphtheria mortality in my hospital used to be 4–7 per cent., since 1926 the mortality has risen to 25–35 per cent. Even patients injected with large doses of serum on the first day have succumbed within 24 hours. In order to answer the question whether this means the beginning of a new pandemic we must glance at the epidemiological history of diphtheria. Since 1894 a decrease has been noticed all over the world. As diphtheria serum was discovered in 1894, the decrease of mortality has been attributed chiefly to this factor. This, however, cannot be the only one, because the morbidity also shows a striking decrease which cannot be influenced by the serum. Some writers explain the decrease of diphtheria morbidity by modern prophylactic measures, but a comparison of the decrease of diphtheria with the decrease of other infectious diseases casts doubt on this explanation. In the period 1866–1896 the decrease of scarlet fever in England was more marked than that of diphtheria, notwithstanding the fact we did not know anything about the virus of the former, and had not therefore the means of organising prophylaxis. It seems necessary to emphasise the fact that the decrease of diphtheria is not entirely due to therapeutic or prophylactic measures, so that the outbreak of a new epidemic is always possible. The fluctuations of the epidemic spread may depend upon the virulence of the bacillus and the susceptibility of the population. During the present epidemic in Berlin Dr. H. Schmidt, of Marburg, proved the virulence of bacilli cultivated from severe cases. After an injection of 0·05 c.cm. of a broth culture of living diphtheria bacilli guinea-pigs died within 24–36 hours.

Nevertheless, I doubt whether the fluctuations of virulence of diphtheria bacilli are responsible for the coming and going of the diphtheria epidemics. It seems very difficult to explain the striking and orderly course of diphtheria by the fluctuation of virulence alone. Diphtheria has a typical time-curve, as Gottstein has pointed out, with a constant ebb and flow. It appears as an epidemic extending over some 30 years, disappears for decades, and then begins another period of 30 years.

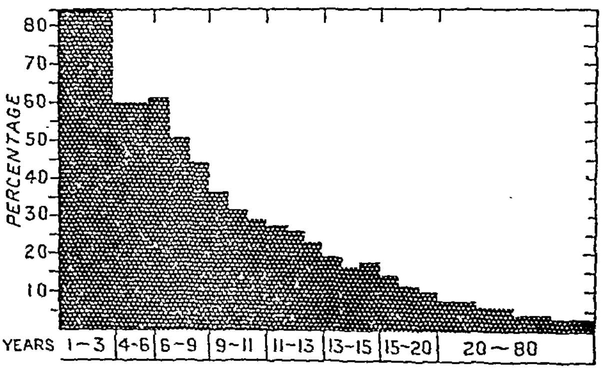
FIG. 2.



Percentage of positive Schick tests in first year of life.

The susceptibility of a population depends first upon inborn resistance, and secondly upon an immunity acquired by manifest or latent epidemisation. Experimental and epidemiological observations prove that there are inborn differences in resistance to diphtheria. Hirtzfeld has stated that the antitoxic titre, one of the most important factors of diphtheria resistance, represents an inborn quality, hereditary like the blood group. Gottstein, in his epidemiological studies, expresses the opinion that the natal predisposition of generations to diphtheria is subject to orderly fluctuations. In the epidemic course of diphtheria the most susceptible individuals succumb to the plague, and the surviving individuals have a high inborn resistance. The immune generation transmits this power to its descendants, and thus a series of non-susceptible generations comes into the world after a severe epidemic, and represent an unfavourable soil for the development of the microbes. In the course of decades susceptible generations arise from the crossing with individuals who had been spared by the epidemic, and under these conditions diphtheria can make its reappearance. There is no doubt that Gottstein's theory explains in a plausible way the orderly coming and going of epidemics. The facts must, however, be more complicated. One predominating factor of the highest importance for the susceptibility of the population has not been considered by Gottstein, and that is latent epidemisation. It stands to reason that latent epidemisation increases with an increase of diphtheria cases; that the spread of the disease is followed by an increasing immunisation of the population, which finally stops the epidemic. With the disappearance of diphtheria cases latent epidemisation also disappears, and generations susceptible to diphtheria gradually reappear. Latent epidemisation produces the same effect as selection by disease.

FIG. 3.



Percentage of positive Schick tests at various ages.

We can recognise, therefore, three factors which may explain the coming and going of epidemic diphtheria: (1) fluctuations of the virulence of Löffler's bacilli; (2) fluctuations of the natural resistance, depending upon selection; (3) fluctuations of immunity gained by latent epidemisation (latent immunisation).

What share these three factors have in the genesis of diphtheria epidemics is a very interesting problem of epidemiology which has been but little studied.

The Extent of Latent Epidemisation in Diphtheria.

We have three different ways of estimating this: (1) the immunity proof (Schick test); (2) the estimation of the spread of diphtheria bacilli by bacteriological methods; (3) epidemiological statistics.

TABLE III.

Mth.	Per cent.	Yr.	Per cent.	Yr.	Per cent.	Yr.	Per cent.
0–3	15	1–3	83·2	10–11	29·3	16–20	14·2
3–6	30	4–6	58·6	11–12	28·2	20–30	12·2
6–7	56			12–13	26·6	30–40	10·6
7–8	63	5–6	60·3	13–14	23·1	40–50	7·8
8–9	83·8	6–7	50·4	14–15	19·7	50–60	6·4
9–10	93·1	7–8	43·5	15–16	17·8	60–70	4·9
10–11	87·0	8–9	36·6	16–17	18·4	70–80	4·9
11–12	91·1	9–10	32·2				

Mth. = months. Yr. = years.

The Schick test has been carried out on millions of children in America, England, Holland, and Russia, and the theoretical elements of the reaction are, therefore, generally known. After an intradermal injection of one-fiftieth of a lethal dose of diphtheria toxin, as tested on guinea-pigs, all persons possessing no diphtheria antitoxin in their serum show a local inflammation, whereas those people who have more than one-thirtieth of an antitoxin unit in their serum show no reaction. Parker and Zingher showed that the positive result of the Schick test depends first of all on the age. (See Table III. and Figs. 2 and 3.)

The number of new-born Schick-positive individuals is small. It attains the maximum at the end of the first year of life, and then sinks rapidly and progressively. The negative test in the new-born infant depends on the transmission of antitoxin from mother to infant by way of the placenta, and perhaps with the milk. The extensive studies of Zingher showed that the gradual disappearance of positive Schick tests with increasing age is due to a latent epidemisation, and stands in a certain relationship to the density of the population. Zingher found that 87·3 per cent. of the school-children in the poorer, thickly populated districts, and 50·2 per cent. of those from the well-to-do classes were negative. The number of Schick-negative pupils in country districts is not more than 23·1 per cent. The greater the possibilities of contact, the higher is the rate of Schick-negative individuals.

The studies of Joannon and Lereboullet in Roumania are of great interest. These authors observed that all children showing a positive test on reception in a surgical department became negative after one year's stay at the hospital. The same result was obtained by Zingher. Among the children of a home he found that 33·3 per cent. of those who had been less than three months in the home were Schick-positive; of the older inhabitants not more than 3·4 per cent. These observations leave no doubt that the disappearance of positive Schick tests, corresponding to increasing age, is due to a latent epidemisation of the population by the diphtheria bacilli. A latent epidemisation of this extent cannot be accounted for by the number of diphtheria cases. I have calculated that, as far as Berlin is concerned, some 3·3 per cent. of the 10-year age-group have overcome diphtheria, but not less than 70·7 per cent. of this group show a negative Schick test. In other words, 67·4 per cent. of the population lose their susceptibility towards the diphtheria toxins at the early age of 10 in the way of temporary carriership.

Bacteriological Results.

The results of the Schick test show a degree of latent epidemisation that proves the diphtheria bacillus to be ubiquitous. This ubiquity, however, although accepted by Roux has been rejected in Germany by Robert Koch and his adherents. The answer to this question depends upon another problem, whether the pseudo-diphtheria bacillus, a very common saprophyte, and the diphtheria bacillus are identical or two very different species. No compromise has yet been reached between unitarians and dualists. I prefer to restrict myself in my epidemiological discussions to microbes which are generally recognised to be pathogenic—that is to say, to the virulent diphtheria bacillus.

We are well informed about the percentage of virulent diphtheria carriers in schools and barracks. The rate obtained depends on whether or not diphtheria cases have occurred in these institutions. In schools the average rate of carriers amounts to 10–20 per cent., but can be much higher. Seligmann, for instance, found that in a class where eight cases of diphtheria had been suspected, 33 out of 46 children were carriers. It is of much greater importance from an epidemiological point of view to know the number of diphtheria carriers in a dense population where cases of diphtheria have not occurred.

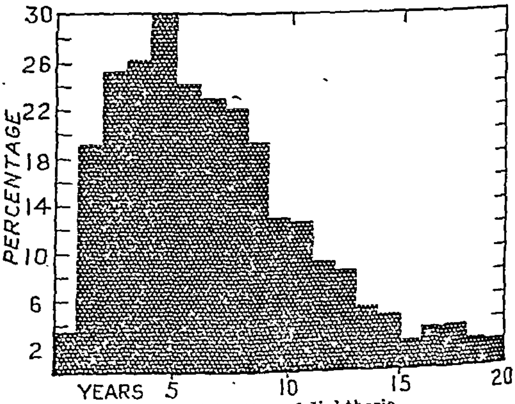
The very large number of investigations carried out in schools all over the world give a maximum of 5 per cent. and a minimum of 0·8 per cent. We can, therefore, consider that the average number of virulent carriers amounts to 2·5 per cent. Positive results are much more frequent if we analyse the nasal secretion of babies. Out of 55 babies Kirstein found 27 per cent. to be carriers of virulent diphtheria bacilli. If they were investigated daily from the first day of life, the rate rose to 85 per cent. Similar figures have been reported by Wiltschke. If we confine ourselves to the rates obtained for school-children and adults they will appear at first sight to be low. These rates seem to confirm those authors who deny the ubiquity of the diphtheria bacillus, but they are the results of one single investigation. We obtain quite different figures if we ask how many of the children will become carriers in the course of a year. It is known that diphtheria bacilli do not live long in a healthy organism, and if we suppose that on the average each school child carries diphtheria bacilli for four weeks in a year, we are allowing an ample margin. In order to maintain the quota of 2·5 per cent. of carriers we must multiply this figure by the number of months in the year, which gives the proportion of carriers among school-children as 30 per cent. If we apply these results to the entire population, we come to the conclusion that in one year about one-third of the population is infected with diphtheria bacilli without contracting the disease. This assumes latent epidemisation, which is practically equivalent to the ubiquity of the diphtheria bacillus.

TABLE IV.—*Giving the Age-distribution of Diphtheria.*

Age in years.	Per cent.	Age in years.	Per cent.	Age in years.	Per cent.
0–1	3·8	7–8	22·7	14–15	4·8
1–2	18·4	8–9	19·2	15–16	2·6
2–3	25·9	9–10	12·4	16–17	3·0
3–4	26·3	10–11	12·3	17–18	3·4
4–5	30·3	11–12	9·4	18–19	2·4
5–6	24·9	12–13	8·5	19–20	2·2
6–7	23·3	13–14	5·5		

Diphtheria is a children's disease (Fig. 4), but the correspondence of Table IV. with the curve of positive Schick tests (see Figs. 2 and 3) proves that the immunity of the older age-groups is not physiological but acquired by latent immunisation. The ubiquitous spread of diphtheria makes it impossible to state whether there would be a lack of adult immunity in a population which had been spared by the disease. Degkwitz asserts that the share of adults in the morbidity of diphtheria is higher in the country than in cities.

FIG. 4.



Age-distribution of diphtheria.

In Berlin the age-groups above 15 show a diphtheria morbidity of 17·1 per cent., whereas in the country town of Greifswald and its rural surroundings the morbidity of these groups amounts to 33·3 per cent. Statements regarding the influence of density of population and social conditions are very contradictory. The general opinion inclines to the belief that the spread of diphtheria is favoured by density of population, which increases the possibilities of contact. The observations of Reiche in Hamburg are very valuable. The conditions there are favourable, because the parts of the town inhabited by well-to-do people are isolated from those of the poorest classes. In the period from 1901–1914 the mortality was: rich, 5·9 per cent.; poor, 16·6 per cent. The morbidity-rate, however, was in inverse ratio: rich, 118·4 per cent.; poor, 86·9 per cent.

We should not, however, consider these rates as an expression of the real case-incidence, because in well-to-do families the physician is consulted for lighter cases.

If contact be the predominating factor it is obvious that the frequency of illness should be less in the well-to-do quarters than in thickly populated areas where the hygienic conditions are unfavourable. The local distribution of cholera among the rich and the poor in 1892 is an example of an illness where contact is of predominating importance, but where latent epidemisation has no great effect. The following figures give the number of cholera cases arranged according to the income-tax classes:—

Income.	Total cases.	Deaths.
600–1200 Mk.	116·84 per mille	59·69 per mille
More than 5000 Mk.	24·63 „	13·08 „

The relations between density of population and diphtheria morbidity find an adequate explanation only if we accept the theory of latent epidemisation.

Practical Conclusions for Prophylaxis.

Our sanitary precautions are based upon the belief that we are able to find the carriers by bacteriological tests and make them harmless. In special cases, such as the family, schools, and military barracks, these measures are possible and even necessary, but it is quite uncertain whether we should be able to achieve any results worth mentioning in an epidemic, seeing that in one year 30 per cent. of the population are temporary carriers. We lack information as to the immediate danger represented by healthy carriers. We have every reason to believe that a carrier is generally much less infectious than a patient. Doull and Hilario Lara determined the proportion between the cases infected by carriers and by diphtheria patients respectively, and found them to be as one to nine or ten. Contrary to the general opinion, they found no difference between the carriers of virulent and non-virulent diphtheria bacilli. They came to the conclusion that the danger of infection by carriers is negligible compared with the danger of infection by patients.

This conclusion may be admitted for single cases, but the small infective danger of carriers is more than balanced by the comparatively enormous number. During 1905 there were 2327 cases of diphtheria in Berlin amongst a population of 2,100,000. We may suppose that in the course of the year some 30 per cent., or 700,000 of the population, were carriers; since the carrier is 10 times less infectious than the patient, we will reduce the number to 70,000. This means that the patients suffering from diphtheria caused only 3·2 per cent. and the carriers 96·8 per cent. of diphtheria cases. The conclusions drawn are of such importance for public health measures that we must be very cautious and prove them by further experience. Similar figures are given by other epidemiological observations. We can obtain an approximate measure for the number of case-to-case infections if we state how many of a given number of diphtheria cases are produced by contact in the family. The League of Nations made inquiries among different nations, and the material is represented in Table V.

TABLE V.

Author.	Total of cases.	Percentage of contacts.
Moldovan (Roumania)	6,341	1·9
Hachta (Prague)	12,126	1·61
Intrario (Italy)	19,004	2·48
Jötta (Holland)	5,130	6·55
Chodzko (Poland)	—	2·5
Sweden	—	3·3
Bulgaria	—	2·15
Norway	—	17·6

Excluding Norway, the family contacts amount to an average of 2·9 per cent. Since contagion is nowhere so easy as in the family, we see that the number of case-to-case infections does not amount to more than 2·9 per cent. of the total of diphtheria cases, almost the same as the 3·2 per cent., calculated as caused by patients. If 97 per cent. of all diphtheria cases are infected by carriers, it is hopeless to fight against a diphtheria epidemic by finding out carriers and isolating them. In epidemics a higher rate takes place in the family contacts. Gottstein's observations on diphtheria in 1895, the climax of an epidemic, showed that the number of family contacts amounted then to 17·6 per cent. of the total of all diphtheria cases.

Active Immunisation.

It is clear why, in spite of the most intensive sanitary precautions, the decrease of diphtheria has been less than that of other diseases, the agents of which have up till now not even been discovered. The classical methods of Koch's prophylaxis, which have proved of use in infectious diseases of the digestive tract, seem to be of no value in diseases transmitted by droplet infection. The fight against diphtheria epidemics is only possible by active immunisation. The methods used in England and America are well known.

More than 1,000,000 children have been immunised against diphtheria, and the material should be sufficient to give an estimate of the value of the method, if we take into consideration the Schick test alone. It seems possible to change a positive Schick test into a negative one in 80–90 per cent. both with toxin-antitoxin mixtures and the anatoxin of Ramon. We are entitled to suppose that these children are, with few exceptions, also immune to diphtheria. But what about the 10–20 per cent. of children who cannot be immunised successfully? Is not this inability to produce antitoxins after immunisation the expression of a special lack of resistance to the natural diphtheria infection? If this is so is not the total of diphtheria cases exclusively recruited from this group of bad antitoxin formers? The number of diphtheria cases is extremely low in proportion to the total of the population; it varied in Germany during 30 years between 0·1–0·6 per cent. The group of bad antitoxin formers is therefore sufficient to provide all the diphtheria cases. This is not a mere hypothesis, for Reich and Weiss have stated that of diphtheria convalescents not more than 50 per cent. become Schick negative. It is reasonable to suppose that the diphtheria patient falls ill because he is unable to form antitoxins. Should this supposition prove correct we cannot rely on the Schick test. The children who are actively immunised are the ones who would become negative in any case through contact with the bacilli, without contracting the illness, and the number of really susceptible individuals is, therefore, not reduced.

The value of immunisation as a preventive measure against diphtheria can only be seen by comparing morbidity statistics among immunised and non-immunised children without considering the Schick test. Unfortunately, although the number of inoculated children is high, the statistics at our disposal are very poor. The only extensive statistics have been made by Park, and refer to 90,000 Schick-tested children. Of these 56,000 were originally negative; 33,000 who had given a positive reaction were actively immunised. In the first group there occurred five cases of diphtheria, in the second group nine cases. Hence, even after artificial immunisation the degree of immunity is lower than in natural immunisation by latent infection. To estimate the value of active immunisation Park controlled these results by a second group of 90,000 children, neither tested nor immunised, in which there occurred 56 cases of diphtheria. In comparing these numbers we must assume that the second group also contained 56,000 Schick-negative children with five cases of diphtheria. Therefore, comparing 33,000 non-immunised Schick-positive children with 51 cases and the same number of immunised originally positive children with nine cases, we find that the number of cases among the non-immunised is five and a half times as great as among the immunised. The American statistics show, therefore, the practical value of active immunisation. Similar statistics should be published in countries where immunisation is commonly in use, and especially in those where diphtheria is widespread and dangerous.

SCARLET FEVER.

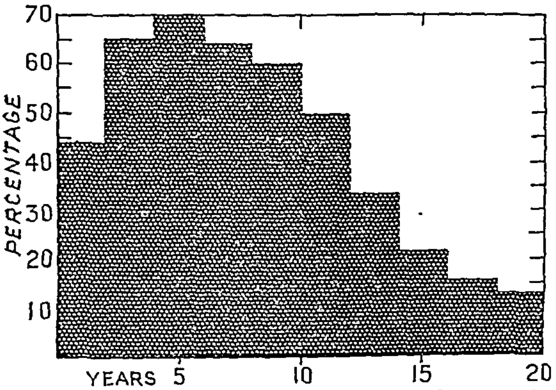
That the epidemiology of scarlet fever also depends upon the extent of latent epidemisation can be seen from the results of the Dick test. Table VI., compiled by Zingher, shows that the result of this test depends, like that of the Schick test, upon age. (See also Fig. 5.)

TABLE VI.

	Positive per cent.		Positive per cent.
0–6 months	44·8	5–10 years	33·2
6–12 ,, ...	65·3	10–15 ,, ...	22·8
1–2 years	71·6	15–20 ,, ...	16·8
2–3 ,, ...	64·2	More than 20 years	14·4
3–4 ,, ...	60·5		
4–5 ,, ...	48·2		

The Dick test becomes negative earlier in the city than in the country, and among the poor than among the well-to-do. At the beginning of this century Moser and Gabritschewsky regarded the streptococcus as the microbe of scarlatina, and built up the prophylactic and therapeutic methods which are now in use. But their evidence was not conclusive, and the streptococcal ætiology was generally rejected, until Dochez and the Dicks established it, and refuted all objections. There were two arguments against the streptococcus: (1) the impossibility of differentiating the scarlatinal streptococcus from other streptococci; (2) the almost complete immunity after scarlatina, in contrast with the lack of immunity following other diseases caused by streptococci.

FIG. 5.



Percentage result of positive Dick tests at yearly age-periods from 0–20.

Dochez, Avery, and Lancefield claim to have differentiated the scarlatinal streptococci by means of agglutination; I have not been able to confirm these results and others have been equally unsuccessful. Some technical difficulties have not yet been elucidated. The Dick method of differentiating the scarlatinal streptococci seems to me to be of great importance. The Dicks could demonstrate a toxin specific for scarlatinal streptococci and absent in all other streptococci. All animals examined have proved insusceptible to this toxin, and only the goat shows an inconstant local inflammation after intradermal injection. Man, however, is very susceptible and shows all the characteristic symptoms after injection. After an intramuscular injection of about 0·5 c.cm. of a culture filtrate of scarlatinal streptococci, a person susceptible to scarlatina shows, after only a few hours, the following signs: vomiting, high fever lasting for 48 hours, and accompanied by a typical scarlet exanthem, scarlet tongue, and eosinophilia. This disease differs from genuine scarlatina only in that it is not contagious, because it is not an infectious but a toxic disease. The scarlatina toxins are demonstrable with the Dick test, which consists of the intradermal injection of 1/1000 c.cm. of a culture filtrate. Its specificity is not yet quite clear. Most streptococci reach to a larger quantity of filtrate (ca. 1/100 c.cm.), but the specificity of the Dick test is based on the following facts:—

1. It is only positive for persons susceptible to scarlatina; convalescents from scarlatina and individuals who have already had it give, with few exceptions, a negative result.

2. The scarlatina toxins can be neutralised with serum of scarlatina convalescents as well as with an artificial antitoxic scarlatina serum.

Results contradicting the specificity of the Dick test seem to be explicable by the use of filtrates containing also proteins of the bacteria, which give allergic reactions opposed to the specific Dick test. That is to say, they cause positive reactions in just those who are sensitised because they have recovered from scarlatinal infection. In order to eliminate the fallacy due to the presence of proteins it is always necessary to control the test by a toxin solution previously heated to 100° C. for one hour. In my experience even this control is not sufficient, probably because there are also thermolabile proteins in the filtrates. Another argument raised against the specificity of the Dick test is that sometimes streptococci cultured from other diseases form a specific scarlatina toxin. I have never met with such a strain, and according to the recent investigations of Jacobson and Szirmay they are rare. I cannot regard their existence as an objection to the specificity of scarlatinal streptococci, which differ from others only by the formation of a specific toxin, but possess the pyogenic properties of all streptococci. It is therefore easy to understand how a scarlatinal streptococcus may produce a suppuration or a puerperal sepsis in an individual immune to scarlatina. There are other equally convincing facts in favour of the ætiological rôle of streptococci. The two Dicks, as well as Nicolle, Conseille and Durand, were able to obtain typical scarlatina in susceptible persons by painting the throat with a small quantity of scarlatinal streptococci. Finally, Dochez and the two Dicks succeeded, by immunising a horse with the toxins of scarlatinal streptococci, in obtaining an antitoxic serum of excellent therapeutic effect in scarlet fever. I have used this serum in 300 cases, and in uncomplicated scarlatina its efficacy is quite marvellous. A further proof of the specificity of this serum is that it exhibits the so-called Schultz-Charlton blanching phenomenon; in other words, it is capable of setting free the toxins of scarlatina in vivo, bound until then to the cells of the blood capillaries. In my opinion the ætiological rôle of the *Streptococcus hæmolyticus scarlatinæ* is better established than that of any other pathogenic agent. In Germany it is still regarded as very doubtful and it has been pointed out that a filtrable virus might also play a part. I consider this supposition entirely hypothetical and superfluous. We have filtered the water which had been used for gargling by persons suffering from acute scarlet fever; we painted the throat of susceptible persons with the filtrate and found that even convalescents from angina caused by hæmolytic streptococci remained free from scarlatinal symptoms.

The Contagiousness of Scarlet Fever.

In collaboration with my assistant Dr. Deicher I undertook the task of analysing bacteriologically the path of scarlatina contagion. The streptococci were identified by the Dick test. We found that the skin scales previously purified did not contain any streptococci; we may therefore conclude that they do not eliminate the scarlatinal microbe. We did not find any streptococci in the urine. The principal focus is the tonsil where we, like Dochez, found them in all cases. Besides that they were only found in the pus. The transmission occurs principally by droplet infection, and infection through objects in common use must be considered. In the beds, on the walls, and in the air of rooms occupied by scarlatina patients we found numerous streptococci.

The occurrence of streptococci can be used to recognise scarlatina patients and healthy microbe carriers. The practical application of such an investigation, however, involves many difficulties. The differentiation of streptococci by agglutination seems to be uncertain, and the toxin proof is much too complicated to be applied as a routine. I am inclined to deny that the occurrence of hæmolytic streptococci in the throat has in itself diagnostic value. Although the streptococcus hæmolyticus does not normally belong to the bacterial flora of the human throat, we meet with it in other diseases which we must exclude in diagnosing scarlatina—e.g., common angina. The occurrence of hæmolytic streptococci is therefore of no diagnostic value in acute scarlet fever; on the other hand, the absence of hæmolytic streptococci in the throat makes scarlatina improbable. This may be of practical value. If a patient has just recovered from scarlet fever we cannot be quite sure that the hæmolytic streptococci in his throat are scarlatinal, but we can conclude that a convalescent in whose throat we do not find any streptococci is completely free of scarlatinal microbes. Although there is no absolute safety, there is at least the same probability as in the bacteriological control of diphtheria. We have no information as to the period of contagiousness of scarlatina convalescents. It is customary in Germany to restrict the isolation to six weeks, or until desquamation ceases. We do not know whether many convalescents are free of microbes before this, but we know for certain that even after six weeks' isolation transmission has occurred in the family. We have found hæmolytic streptococci in the throats of 100 per cent. of convalescents on the day of their leaving the hospital after six weeks. This easily explains the frequency of return cases. We concluded that the patients failed to lose the microbes because they were constantly being reinfected. We therefore organised an intermediate "ventilation" block (Lüftungsstation), to which the patients who had but few microbes in their throats were transferred. No recent scarlatina cases were admitted to this block. The consequence was that the majority of patients could be dismissed after a six weeks' stay, free from streptococci. Many of them lost the streptococci after three to five weeks. On one occasion, however, a patient suffering from a wound scarlatina was admitted to the hospital; she had as usual in such cases no hæmolytic streptococci in the throat. She was therefore transferred to the intermediate block, and remained for three weeks free from streptococci. After that time recent cases of scarlatina were admitted to this block because the scarlatina wards were overcrowded. Two days afterwards we found hæmolytic streptococci in the throat of this patient.

We have made a practice of dismissing patients from the intermediate block irrespective of the period of illness and the existence of desquamation if the throat has proved free of hæmolytic streptococci at three examinations. Many patients could be dismissed after three to five weeks. Among 39 patients dismissed without bacteriological examination there were four return cases. Among 50 patients dismissed after examination no return cases occurred. A bacteriological control is therefore a far greater guarantee against return cases than routine dismissal after six weeks and after disappearance of the scales. Bacteriological control will also save the patient from unnecessary restrictions and reduce public expenditure. Of 40 private patients more than half had no streptococci after a period of two to three weeks.

Before the American investigations were known in Germany Degkwitz had used scarlatina convalescents' serum in the prophylaxis of 1000 cases with excellent results. I have obtained the same good results, and have never seen a failure among hospital cases treated with serum taken six weeks after the outbreak of the disease. Its efficacy is due in the first place to the antitoxin content, and sera of poor efficacy can be excluded by the Schultz-Charlton phenomenon. We proved by this method that the serum of many adults contains almost the same quantity of antitoxin as convalescents' serum. This fact is of eminent practical importance when sufficient convalescent serum is unobtainable. Convalescents' serum has a considerable bacteriological power against scarlatinal streptococci, a power which is lacking in artificial immune serum. This may have a share in its prophylactic effect. We use 5 c.cm. of convalescents' serum for children and 10 c.cm. for adults. The protection may last about four weeks. If no convalescents' serum is at our disposal we use artificial immune serum, but its prophylactic efficiency seems less reliable and disappears two weeks after injection. In order to avoid unnecessary serum injections, the individuals needing protection may be selected by the Dick test. This previous testing is useful in children's homes where enormous quantities of serum would otherwise be needed. In a children's home in Berlin in which cases of scarlet fever had occurred 126 inmates were tested by Dr. Deicher; 43 had a positive reaction, 83 a negative one. Of the 43 positive children 7 took scarlet fever, of the 83 negative children only 2 fell ill with scarlet fever, and 3 with angina. Thus a higher percentage of the positive children caught scarlet fever (18 per cent.: 2·4 per cent.). An absolute protection is therefore not guaranteed by the negative Dick test. Bacteriological control and serum prophylaxis place at our disposal preventive measures which are very effective in single cases but, as in diphtheria, these methods are only of limited value in public health campaigns against scarlatina, on account of the enormous number of healthy microbe carriers. Only active immunisation would ensure complete success. In 1912 Gabrischewsky in Russia immunised by means of vaccines of scarlatinal streptococci. The results seem to have been very good, and it is surprising that these methods fell into oblivion. Since the discovery of the scarlatina toxin immunisation by its means has been resumed on a large scale in America, Hungary, and Poland. There is at present no agreement with regard to the dosage. The skin test dose is generally accepted as the toxin unit, but the amount used for immunisation differs widely. The total number of children inoculated with scarlatina toxin all over the world may already amount to 100,000. The results agree in showing that the experimenters have succeeded in changing a formerly positive Dick test into a negative one in 50–80 per cent. of the cases. It will need a longer period of observation to determine whether a protection against natural infection is also attained by this immunisation.

THE TREATMENT OF RHEUMATIC CARDITIS.*

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THE treatment of rheumatic heart disease is doubly discouraging; long-continued efforts so frequently appear to have been wasted, and the patients themselves are often the brightest and most cheerful of those in a children's ward. There is a very real danger, therefore, of feeling that whatever is done the outcome is likely to be the same, and of allowing one's efforts to relax. Only by holding to first principles and by refusing to be disconcerted by the long list of failures are the best results likely to be obtained.

In the treatment of active infective disease there are two objects: the removal of the causative agent and the amelioration of symptoms. Seeing that the cause of acute rheumatism is as yet unknown, although streptococci are suspect as accessory, if not as primary agents, attention is of necessity directed to the second of these aims. The primary object of treatment will be made most clear by considering two main factors which interact throughout the duration of the disease. They are (1) the continuous

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[*] A post-graduate lecture given at the East London Hospital for Children, Shadwell.

nature of the infection, and (2) the situation of the lesion. Infection in acute rheumatism is a continuous process. Occasionally the disease seems to run a clear and well-defined course, but more often it is insidious in its onset and treacherous in its simulation of quiescence. During this period of activity, which may last for many months, the virus is continually at hand and ready to take advantage of the slightest opportunity. Evidence of this is found in the continued fever, the leucocytosis, and the periodic outcropping of nodules. The other factor is the situation of the lesion. The valvular lesions occur almost invariably along the line of apposition of the cusps. The pericardial lesion, by its very definition, is found where the visceral and parietal layers rub. The articular lesions are similarly situated at points open always to mild trauma. The nodules occur where the elbows, ankles, and knees are most exposed to knocks or pressure, and where the occiput and spine meet the pillow and mattress. Nor is it unreasonable to imagine by analogy that the lesions present in the substance of the myocardium are similarly affected by stress and pressure, though in this case the exact physical determinants are less easily analysed. The myocardial disease is, of course, the ultimate factor in prognosis, but that of the valves is more easily visualised, and is more readily used as an example.

Continued mild trauma and continued infection thus seem likely exciting causes of those permanent lesions, the cumulative effect of which gives acute rheumatism its chief fatality. From this it follows that, if the infection cannot be suppressed, attention should be continually directed to reducing trauma. Rest during the period of active disease is imperative. A reduction in the pulse-rate of 10 beats per minute means that the inflamed cusps are snapped together 14,400 times less in the 24 hours, and a reduction in the pulse-rate from 130 to 80 saves them from 72,000 collisions in the same period. The cumulative saving of 10 beats per minute for three months cannot be over-estimated. Expressed in percentages, a saving of 10 beats per minute, the rate falling from 90 to 80, means a reduction in the total number of beats occurring in 24 hours by nearly 9 per cent., and a saving of 50 beats per minute, the rate falling from 130 to 80, means a reduction in the 24-hourly number by 26 per cent. These figures also apply to the saving in the stress and pressure which probably involve the equally important myocardial lesions during systole.

The diminution in rate has other interdependent results: diastole is prolonged, the total time spent in systole is shortened, and the cardiac work is reduced to a minimum. During diastole the heart muscle-fibres receive their nutritive coronary blood-supply and eliminate waste products; thus a shortened diastole, or a faster rate, encroaches upon the time available for this. If we apply these principles to treatment the canon that emerges is that *the heart-rate must be kept as low as possible during activity.*

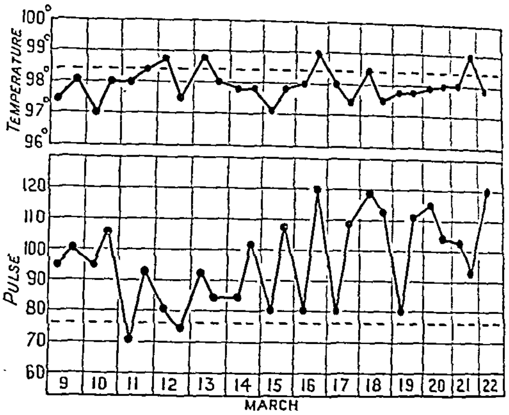
The Assessment of Activity.

The activity of rheumatic carditis is assessed by attention to the following points: Presence of nodules; presence of fever; presence and type of tachycardia; cardiac dilatation; presence of a leucocytosis; variation in the hæmoglobin percentage; appearance of the patient; and electrocardiograph tracing.

Nodules.—The appearance of rheumatic nodules is to be taken as indicating that active rheumatic carditis is present, their presence that an active rheumatic carditis is either present or very recent. Their significance is not altered in the absence of fever. Nodules are more easily seen than felt, especially when small. The elbow, for example, should be held flexed in a good oblique light and the skin made to slide over the deeper tissues; the nodules are often seen to move slightly under the sliding skin. In doubtful cases the two sides should be compared.

Disappearance of nodules does not necessarily mean that the disease has become quiescent, though it usually suggests an abatement. (See Fig. 1.)

FIG. 1.



The chart of a child suffering from active rheumatic carditis. Both temperature and pulse curves prove the presence of activity. The irregular variation in the former, although a higher reading than 99° is not reached, is significant.

Fever.—The temperature chart in active rheumatic carditis has two characteristics; pyrexia is usually present in spite of adequate salicylate administration, and the temperature curve shows unusual changes in level. Fever is significant, even when the readings reach such unsensational figures as 98·8° or 99°. The changes in level are most readily appreciated from the chart, and frequently occur in an apyrexial patient. Absence of fever does not necessarily indicate that the disease is quiescent. Nodules may appear in an apyrexial patient. The phrases "bed fever" and "constipation fever" are sops to conscience.

Tachycardia.—The spikiness of the pulse chart during activity is even more striking than is the irregularity of the temperature curve. To appreciate it, it is necessary to chart the pulse-rate properly. The practice of writing a double line of figures at the bottom of a chart is merely a means of hiding valuable evidence. In most cases of active carditis the pulse-rate varies very greatly within a few days, producing a curve like a silhouette of some mountain range. With quiescence the undulations become milder and ultimately vanish.

Cardiac Dilatation.—The relative position of the apex beat from time to time, as measured in inches from the mid-line, is of considerable value in estimating activity. A dilating heart in acute rheumatism is inevitably a poisoned heart, and one diminishing in size is as frequently one whose freedom from toxæmia allows tone to be re-acquired. Should the position of the apex beat remain unchanged, no conclusion one way or the other can be drawn. Two sources of fallacy must be borne in mind. An adherent pericardium may fix the apex beat, and a full meal may, in a child, displace it to the left by as much as half an inch. All measurements are, of course, taken with the patient lying flat on the back.

Leucocytosis is an almost constant finding in active acute rheumatism.[1] It is seldom very high, figures near 12,000 being usual, except with the onset of an acute pericarditis, when considerably higher values occur. The persistence of even a mild leucocytosis is strong evidence that the disease is still active; its absence is unusual, but does not necessarily indicate that infection has ceased. The persistence of a leucocytosis in the absence of any other sign or symptom of activity suggests recrudescence.

Hæmoglobin Percentage.—Nearly all cases of active rheumatism have some degree of chlorotic anæmia. Weekly estimation of the hæmoglobin percentage is a valuable, accurate, and easy means of obtaining evidence upon the progress of the case.

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[1] Swift, H. F., Miller, C. P., and Boots, R. H.: Jour. Clin. Investig., 1924–25, i., 197.

Appearance of Patient.—There is no doubt that the facial expression and appearance of a patient in whom the disease has become inactive is often characteristic. There is an absence of puffiness and of the fevered, slightly emotional expressions that flit across the face of the rheumatic child. The appearance suggests calm, relaxation, and comfort.

Electrocardiograph Tracing.—A mild degree of heart-block is not uncommon in the active stages of acute rheumatism. It is manifested by a prolongation of the P–R interval to 0·2 seconds or more. If present and frequently measurable, it will be an additional check upon the prognosis of a still active lesion. Its absence is of no help in assessing the presence or degree of activity.

Relation of Signs of Activity to Treatment.

If one or more of the above signs of activity be present in a patient recently diagnosed as suffering from active rheumatic carditis, they should be carefully followed until one and all have disappeared. Persistence of any of them indicates that the patient should be confined to bed. The time of final disappearance of the last sign should be noted, and ideally the patient should lie flat in bed, with one thin pillow, for at least another two months. At the end of this period further steps may be taken at intervals of a week. These are, in order, an allowance of extra pillows, sitting up for half an hour, for an hour, and so by gradations of half an hour up to three hours. During this time massage of the legs should be instituted. Finally the patient is allowed to walk. First a few steps to a chair only are taken, and by degrees more and more exercise is allowed. If facilities exist and the climate permits, these stages of treatment can with advantage be undergone in the open air.

Steady progress in convalescence is only possible in patients who show none of the signs of activity. Should any one sign reappear, the patient should go back to bed and recommence the unabridged programme.

Prevention of Tachycardia.

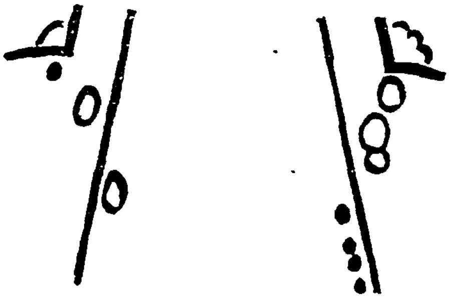
Rest in bed, with one flat pillow, is the only way of keeping the pulse frequency at its lowest figure. The known causes of physiological tachycardia (exercise and emotion) must, of course, be avoided. There is no drug upon which reliance can be placed to produce a bradycardia. Digitalis[2] will occasionally do this, even with a normal cardiac mechanism, but the effect is infrequent and sometimes transitory.

The Tonsils.

One of the known facts in the pathology of acute rheumatic carditis is the close relation it bears to tonsillar disease. This is so generally accepted that there is no need for further elaboration here. The value of tonsillectomy as a preventive is, however, still under dispute. The practice at the East London Hospital for Children is to remove the tonsil when there is evidence of tonsillar disease, provided the rheumatism is sufficiently inactive. The measure is not devoid of danger, and great care is necessary in estimating the risk of lighting up a fresh spell of infection. The guiding principle is the degree of active carditis, as deduced by the criteria already described. Considerable experience is necessary and each case must be judged individually. The points to be considered in determining whether or not tonsillar disease is present are (1) the history of sore throats, (2) an associated lymphadenitis, (3) the appearance of the tonsils.

A history of sore throats is significant when they have been frequent, or where a rheumatic attack definitely began with them. Any enlargement of lymphatic glands in the neck is to be carefully watched for, and it is wise to examine the neck from behind. Three areas are specifically palpated: just beneath the angle of the jaw, between this and the anterior border of the sternomastoid in the upper third of the neck, and behind the posterior border of the muscle in the lower half of the neck. Any abnormalities are charted, and their variation watched from day to day. In this way it is often possible to decide whether there is an active tonsillar lesion or not. Infections of the scalp, teeth, and middle ear must, of course, be excluded. Changes in the size of the lymphatic glands are charted in the manner shown in the diagram. The two short-angled lines indicate the angles of the jaws, the two oblique lines indicate the sternomastoids. The line enclosed in the jaw angle represents the tonsil, and the lymphatic glands are also shown. Sizes and consistency can be indicated, a black spot marking a hard and a circle a soft gland. An individual soon invents his own formulæ for size and hardness. The exact condition can then be charted in a few seconds with a minimum number of strokes. (Fig. 2.) The size and appearance of the tonsils are valuable criteria if abnormalities are present, but disease may exist even though the tonsils are not enlarged and look superficially healthy. Points indicating disease are enlargement, redness, raggedness of surface, and pus in the crypts. Tonsils should be considered diseased if the history is characteristic or if there is evidence of glandular enlargement.

FIG. 2.



Left Side.—The left tonsil is smooth and slightly enlarged. Below the angle of the left jaw is a small hard gland, lower and between it and the sterno-mastoid is a larger soft gland; lower still and posterior to the muscle is another similar gland.
Right Side.—The tonsil is large and its surface is irregular. Beneath the angle of the jaw is a large soft gland, and between it and the sterno-mastoid two similar glands adherent to one another; lower and posterior to the muscle is a string of hard, shotty glands.

The outstanding danger of tonsillectomy in a rheumatic child is the possibility of lighting up a dormant acute rheumatism. If a state of sufficient quiescence has not been reached, the operation may be followed immediately by fever, tachycardia, cardiac dilatation, and the appearance of a fresh crop of nodules. I have seen three cases of acute rheumatic pericarditis arising in this way; the harm done far outweighs any theoretical benefit. If, however, a state of sufficient quiescence has been attained, and if adequate salicylate dosage is given before and after tonsillectomy, such troubles can be avoided. The dose should be grs. 15–20, with double the quantity of sodium bicarbonate, two-hourly by day, and four-hourly by night if the patient is not asleep. A potassium permanganate gargle is freely used.

Other Measures.

Sodium salicylate is the only drug known to have an effect upon acute articular rheumatism. Evidence has been adduced to prove both that it has and that it has not an effect in the cardiac type of the disease. In my experience it certainly does no harm. It seems to lessen to some extent the number of recrudescences in children attending as out-patients, and on the whole it is valuable in the treatment of the active cardiac infection. The doses given to in-patients are grs. 10–20 two-hourly, with twice the amount of sodium bicarbonate.

Gargles are invariably given, and most children quickly learn the art of using them. Potassium permanganate is probably the best; it is easy to carry in the form of crystals, and these are dissolved by the patient or the mother in warm water until a light red colour is obtained.

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[2] Sutherland, G. A.: Quart. Jour. Med., 1918, xii., 183.

These two forms of treatment have proved their value. Others which have here been given an extended clinical trial in acute and subacute cases during the last eight years are: vaccines, protein shock, the intravenous disinfectants (flavine, gentian-violet, and neokharsivan), and artificial sunlight.

A series of patients were treated with sensitised and desensitised vaccines, with the collaboration of Dr. Mervyn Gordon on behalf of the Medical Research Council. The vaccines were prepared from streptococci derived from post-mortem material of cases of the disease. No encouraging results were obtained.

Protein shock was only tried in four cases, doses of 25–100 million typhoid bacilli being given intravenously. Since each case showed more signs of activity afterwards, no further investigations were made.

Intravenous flavine was given to 12 chosen patients and intravenous gentian-violet to another 12; neither form of treatment had any effect. Intravenous neokharsivan is now under trial.

Artificial sunlight was given to six chosen cases; three were definitely worse and the others were unaffected.

INTRINSIC CANCER OF THE LARYNX.

THE OCCURRENCE OF IMPAIRED MOBILITY OF THE AFFECTED CORD AND ITS VALUE IN DIAGNOSIS AND PROGNOSIS.*

By Sir StClair Thomson, M.D. Lond.,
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It is a truism that stereotyped errors or exaggerations in medicine are difficult of eradication. This is my excuse for returning to the subject of impaired mobility in intrinsic cancer of the larynx.[1] The present observations are based on 70 cases operated on through a laryngo-fissure.

Historical Survey.

The occurrence of this valuable symptom appears to have been first noted by Lublinski[2] and Semon[3] about the same date. In 1886 Semon unfortunately committed himself to the statement that a malignant tumour causes "a considerable impairment of the affected cord at a very early period, and is one of the most valuable and constant points of differential diagnosis." Twenty-one years later, as the result of further experience, Semon saw the need of modifying this opinion considerably[4] but, unfortunately, it had then become embedded in the text-books, and it was difficult to diminish the exaggeration which the weight of his authority had established. His earlier and somewhat misleading opinion is still widely held, so that cases are often dismissed as "quite innocent," or are not referred to an expert in time to secure a lasting cure with a useful voice (by the laryngo-fissure route of operation), simply because "the cord moves quite freely."

I propose to show that interference with the movement of a vocal cord affected with cancer is an occasional symptom, and one of much value, but that it is not an early nor a frequent one.

Author's Material.

My conclusions are based on cases (*a*) operated on by laryngo-fissure, (*b*) with the diagnosis verified in every instance by the microscope, and in which (*c*) the after-history of each case has been followed up to the present date, or until the patient's death. They cover a period of 28 years. Cases which were only seen in consultation, or not operated on, or operated on by other routes, have been left out of consideration. I have had 70 such cases. Mere mechanical interference with the excursions of the affected cord, due to the projection of the growth, was noted when it was present, but is not here included as an instance of impaired, intrinsic mobility.

In these 70 cases the affected cord was quite mobile in 39. In 21 cases the mobility was more or less impaired, being described as "flagging," "sluggish," "limited in movement in anterior (the usually affected) half," or "hardly any movement." In 10 cases there was no movement at all in the affected cord, and it was described as "quite fixed." Thus, in 39 cases, more than half the total, this symptom of impaired mobility was entirely absent.

In five cases paresis developed while under observation. In some it was noticed a month after the first inspection; in others at varying intervals, even up to nine months. (This last case was successfully operated on and survived ten years to die of tubercle.) Where the diagnosis is doubtful, particularly where a biopsy is decided against and a case is being kept under observation, it should be carefully scrutinised once a month to detect any onset of this symptom.

Deductions.

Any defect of movement in a vocal cord, due to cancer, is caused by the neoplasm penetrating into the subadjacent intrinsic muscles. The more a growth projects above the surface, the less likely is this to happen. It is in such cases that a biopsy is often both practicable and, diagnostically, satisfactory. When the neoplasm is imbedded in a cord it tends to penetrate deeply and it is more difficult to obtain a satisfactory portion for section. It is in such cases that the occurrence of impaired mobility is a valuable symptom.

As regards Prognosis.—The occurrence of paresis in a cord, due to an infiltrating carcinoma, is of unfavourable prognosis. In my 39 laryngo-fissures on a mobile cord, two must be left out of account, as they were only operated on this year. In the remaining 37 cases no less than 31 were free from disease at the end of three years (=84 per cent.). Of the cases with impaired movement 15 out of 20 passed the three-year limit without recurrence (75 per cent.). In 10 cases, in which the cord was quite fixed, one died from other causes within 18 months. Of the remaining 9 cases, with complete fixation of the cord, only 4 were free from recurrence three years afterwards (=44 per cent.). Of these cases, 3 died from other causes five, seven, and ten years later. One is still alive and well 11 years afterwards.

As regards Treatment.—Free mobility of a vocal cord affected with carcinoma would indicate the suitability of operation by the laryngo-fissure route, particularly if the disease has not extended to either extremity of the cord and the subglottic area is free. Under the same conditions, a simple paresis or impairment of movement does not contra-indicate the same operation. The removal should be as wide as is possible and the larynx should be carefully and regularly scrutinised once a month during the subsequent year, as any recurrence can be successfully dealt with by a partial or complete laryngectomy.

When the cord is quite fixed, and the disease does not invade either extremity, the same plan of treatment can be successful. Even when, under the same condition, the subglottic space is invaded, a lasting cure may, with the same method, be secured. But if, with a fixed cord, the disease has extended to the base of the arytenoid posteriorly, or crossed the anterior commissure, or extended to the ventricular band, or to the epiglottis, or (downwards) as far as the cricothyroid membrane—some more extensive operation is required.

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* Read before the International Congress of Oto-Laryngology, Copenhagen, July 30th–August 1st, 1928.

[1] StClair Thomson: Intrinsic Cancer of the Larynx: Impaired Mobility of the Affected Cord, THE LANCET, 1920, ii., 183.

[2] W. Lublinski: Berlin Klin. Woch., Feb. 22nd, 1886, p. 122.

[3] Heath's *Dictionary of Practical Surgery*, London, 1886, i., 895.

[4] Trans. Medical Society, London, 1907, xxx., 113.

Summary.

1. Impaired mobility of a vocal cord is not a necessary nor an early symptom of intrinsic cancer of the larynx.
2. It is met with in less than half (about 44 per cent.) of the cases presenting themselves as suitable for operation by laryngo-fissure.
3. It is more apt to develop in an embedded or infiltrating neoplasm than in a distinctly sessible or projecting growth.
4. When present it is a valuable symptom in helping to distinguish a malignant from an innocent neoplasm. It is of little value, and may even be misleading, in diagnosing a malignant growth from a tuberculous or syphilitic deposit.
5. Its absence is of good augury and hence the desirability of making an early diagnosis before it has developed. As regards prognosis, its presence is an unfavourable symptom.
6. Its absence or presence is a valuable factor—in conjunction with other data—in determining the most suitable treatment.

THE ENLARGED PROSTATE AND ITS NON-OPERATIVE TREATMENT.*

BY F. HOWARD HUMPHRIS, M.D. BRUX., F.R.C.P. EDIN., D.M.R.E. CAMB.

FEW diseases from which men of middle or advanced age suffer have so tried the skill of the physician and the endurance of the patient alike as enlargement of the prostate gland. It has been estimated that one in every three men over 60 complains of symptoms caused by an enlarged prostate, and to these sufferers must be added others in whom the enlargement "gives rise to no appreciable symptoms." An enlarged prostate causes local troubles connected with urination, and also, owing to its reciprocal relation with the cerebro-spinal centres, to neurasthenic symptoms. Indeed, Dr. Snow stated that the prostate should usually be examined in men suffering from neurasthenia. Mental sluggishness often accompanies enlargement, and sometimes the only symptom of a chronic prostatitis may be inactivity of the mind. The symptoms for which the patient seeks medical advice arise from the mechanical obstacle to the urinary flow. He often has to strain before the flow can be established, and when the act is apparently finished some more urine dribbles away, often a few minutes after the patient thought his bladder was empty. The time occupied in passing water gradually becomes longer. Nocturnal urination and frequency of micturition are common. When a patient has these symptoms, apart from his discomfort, he is not free from danger. The bladder has lost some of its tone and it is usually distended, so that attacks of cystitis are not uncommon. The patient is liable to attacks of complete retention of urine or to septic poisoning. In the great majority of cases he is instructed in the art of passing a catheter, and his catheter life begins; it would be a bold man who characterises this as either free from risk or a pleasant prospect.

Drug and Gland Treatment.

Drugs are of little use except to relieve the symptoms of irritation, to improve the condition of the urine, or to combat complications, such as hæmorrhage. Cases have been reported of an enlarged prostate, one an ordinary senile enlargement and another a traumatic inflammation in a young adult, in which the administration of ergot (liq. ext. ergotæ, ʒj.) four-hourly, and later, night and morning, apparently reduced the size of the prostate. Organotherapy in this country has not been used to the extent which theoretically it deserves; in France it has been almost a routine treatment for nearly ten years. The argument for the use of prostate extract was based on a theory which may be roughly outlined as follows:—

The fact that prostatic hypertrophy quite commonly follows the functional retirement of the testes has caused many observers to believe that there is some relationship between the endocrine activities of both these glands. It is believed that when the testes become functionally inactive the prostate becomes enlarged in a compensatory fashion, just as other ductless glands enlarge when closely related glands are put out of commission. It is generally accepted that, when deep-seated infective processes and essential new growths of the prostate gland can be excluded, there remains a form of enlargement of the prostate gland which is closely related to waning gonad function. This should theoretically respond to treatment by organotherapy, which would supplement the endocrine function of the testes and thereby lessen the probable necessity for over-activity on the part of the prostate. The extract is administered in capsules, grs. 1½ of the dried extract, and in ampoules containing the equivalent of this dose in a physiological salt solution.

Surgery has without doubt saved many lives and relieved this condition, with operations such as prostatectomy and castration. A masterly epitome of the relation of surgery to this disorder may be found in the Bradshaw lecture given before the Royal College of Surgeons of England by Sir Cuthbert Wallace.[1]

Electrical Treatment.

Electricity will usually give rapid relief (Roger), and in some cases complete relief, from all symptoms. The use of electricity is comparatively little known, since it is mentioned but rarely, and then only in terms of disparagement, a typical sentence reading: "So far it must be conceded that electricity, radiotherapy . . . yield very incomplete, fugitive results."—(Dr. G. Marion, Paris.) I have had experience of electro-therapeutic measures in the treatment of enlarged prostate for over 25 years, and have found, and am finding, them daily of the greatest service.

The three forms of treatment which I am about to describe are: (1) the static wave current; (2) X rays; and (3) diathermy.

Histologically, the enlargement is a proliferation of the constituent elements of the prostate, but in all forms of prostatitis the consistence is less firm and the texture somewhat more open and spongy. There is more fluid than natural in the gland tissue; the mucous membrane may be thinner and more vascular and the duct orifices larger. This mechanical obstruction requires a mechanical means to remove it, and nothing can compare with the static wave current, which was accidentally discovered by Dr. W. Benham Snow some 30 years ago when he was treating an intrapelvic neuritis. The patient had a large, tender prostate, which was found to be softened and reduced in size after the application of the electricity, and Dr. Snow says that no work he has done since has given him greater satisfaction. In 1902 Dr. Snow gave me the benefit of his experience, and since then I have used his method continuously, and can recommend it with confidence. The very nature of the disease makes it peculiarly suitable to the action of the static wave current. We have a structure which is partly glandular and partly muscular. We can place an electrode alongside the diseased structure and apply the current almost directly to the pathological gland. Muscular contractions are induced, the gland tissue is contracted, and the products of inflammation are squeezed out. These accumulations having been mechanically expelled, a tonic circulation is restored to the gland by the electrically stimulated cell activity. Each successive treatment gives more and more power to the muscle-fibres and more tone to the glandular structure, leaving the gland smaller and of more normal consistence until there is little left but healthy muscle-fibre and healthy gland tissue, except in those very long-standing cases where the hyperplastic fibrous tissue still persists.

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* Paper read at the Second International Congress of Radiology at Stockholm, July 30th–August 1st, 1928.

[1] Brit. Med. Jour., Nov. 19th, 1927.

The treatment discovered by Snow remains practically the same to-day. The details are as follows:—

> A metal electrode is passed into the rectum and pressed against the gland. It is attached to the positive side of the machine, the negative being grounded. The sliding rods, touching each other at first, are gently and slowly opened according to the toleration of the patient. The treatment continues for 20 minutes. The effect on the prostate tissue is strictly mechanical, and there is no electrolytic or thermic action. When the current is applied with a metal electrode in the rectum over the prostate gland it causes alternate recurrent contraction and relaxation of the tissues. The current is regulated in the rate of discharge at the spark gap by controlling the speed of the machine, so that the periods of contraction alternate with the periods of rest at the rate of 120 or so to a minute. The sinusoidal current from the morse wave generator—the wave water interrupter of Turrell and the de Wattville current, or the Smart-Bristow coil with hand interruptions—may be used when a static machine is not available, but no current can replace the static.

It occurred to me that sparking the prostate should have an especially good effect in obstinate cases, and therefore I had made an ordinary metal prostatic electrode on a vulcanite handle. Thus, on the principle of Snow's spark director, a spark applied to the knob would have the effect of a spark applied to the gland. In all sparking the spark gap should be wide open, the negative side of the machine connected to the platform by means of the shepherd's crook, and the positive side and the ball attached to separate groundings. I cannot say, however, that this gives any better results than the ordinary static wave current.

Patients often remark, even at the end of the first treatment, that the perineal sense of weight is less, and after daily treatment for a week or ten days and tri-weekly séances thereafter for a month or six weeks, the congestion and engorgement have disappeared, and with them the pain, discomfort, and necessity for getting up at night. The condition of the bladder has also improved, and I am inclined to attribute this, in part at least, to the stimulation of those unstriped muscle-fibres which continue to the bladder. These fibres have to be stimulated to contract, and with this exercise would naturally acquire more power and tone, not only in their prostatic portion but in their vesical part as well, and would thus give more muscular force to the bladder and greater power to get rid of urine.

Often after one treatment the gland is reduced in size, loses its tenderness, and is softened throughout its entire structure. The treatment should be given often enough to prevent a relapse—probably daily. As the gland grows smaller and softer the subjective symptoms grow less and less until they disappear entirely.

In the very aged, or where there is much fibroid tissue, we can only hope for an abatement of the inflammatory process, but even here we get a marked improvement in the tonicity of the unstriped muscle-fibre, both prostatic and vesical. In other cases, even where the condition has lasted for a number of years with cystitis and difficult micturition, we get an improvement so marked with the forcing out of the infiltrating exudates that in the patient's estimation it amounts to a cure.

Until seven or eight years ago, for cases where infection complicated the enlarged prostate, I used glass vacuum electrodes energised by the static machine and connected to the negative side of the machine, the positive being grounded. My theory was that a germ-destroying effect was produced.

Iodine and thiosonamin have been administered by ionisation, but the results have been disappointing. Both these methods were introduced by Neiswanger, who lays down the following rules:—

> A large sized prostatic gum-elastic catheter is used in which is a galvanised iron wire stylet; round this is loosely wrapped some cotton-wool soaked in a solution of thiosonamin. The end of the catheter is provided with numerous perforations. The instrument is attached to the positive pole, with the negative pole connected to a large abdominal pad. About 10 milliampères are allowed to flow for ten minutes every fourth day.

I have little practical experience of this method, and have found it inferior to other forms of treatment.

A Typical Case.

A man of 65 consulted me on Sept. 22nd, 1911. About six or seven years previously he had noticed frequency of micturition, especially at night. This had apparently got a little better, but lately it had troubled him acutely. He got up at least five times a night to pass water; he could retain urine for four hours at a time during the day, but it was more comfortable to pass it every two hours or so. He also complained bitterly of a second involuntary flow some minutes after finishing micturition, of discomfort before and after micturition, and of a dragging sensation during the day. He also had a pain in the back, which he called lumbago. Physical examination showed that an enlarged and fairly hard mass, the size of a hen's egg, occupied the whole of the prostate. There was nothing in his history or general health to call for comment, except that he had never had any venereal disease.

Treatment was instituted at once with the static wave current on the prostate, and after 20 applications was discontinued on Nov. 9th, the prostate being about half the size that it had been on Sept. 22nd. The records for these days were as follows:

Date, 1911.	Retired to bed.	Disturbed for micturition.	Date, 1911.	Retired to bed.	Disturbed for micturition.
Sept.	P.M.	A.M.	Oct.	P.M.	A.M.
22	11	No change.	19	11.45	4.30, 6.30
23	11	,,	20	10.45	1.45, 6
24	11*	,,	21	11	2.30, 6.30
25	11	4.30	22	11	2.30, 6
26	10.30	4	23	11	3.15, 6.45
27	11	12.30, 4, 5.30	24	10.45	3.15, 5
30	10.30	5	25	10.45	5.30
Oct.			26	11.15	3.30, 6.30
1	—	1,30, 3, 4.45, 6	27	11.15	1, 5.30
3	—	3.15, 5	28	11.15	4.45
4	—	5.45	29	11	3.30
5	—	1.30, 3, 4, 5, 6	30	11	2.30, 4.30
7	—	1.45, 6.15	31	11.15	3.30
8	—	4.45	Nov.		
9	—	2.5	1	11.15	3.45
10	—	4.30, 6.30	2	11.15	6.15
11	11.45	3.15, 5.30	3	11.15	6.30
12	11	5.30	4	11.30	7
13	11	4	5	11	5
14	11	3, 6	6	10.45	2, 6
15	11	12.15, 1.45	7	12	6.30
16	11	3.15, 6.15	8	11.15	4.30
17	12	4.15, 4.45	9	11	4
18	10.45	5.30			

* Discomfort after micturition less. "Lumbago" pain gone. Frequency of micturition the same.

The patient arose each morning at 7.30 and passed water. From the end of October he was disturbed but once nightly.

X Ray Treatment.

Much benefit has been obtained by the use of X rays, but cases must be carefully selected. The simple adenomas are extremely sensitive, but the presence of fibrous tissue reduces the sensitivity, so that adenofibromas and fibromyomas react in inverse proportion to the amount of fibrous tissue present. When the prostate is large and soft, good results can be expected, but X rays are of little value in the treatment of hard, bossed glands elevating the floor of the bladder. Suitable cases respond rapidly; the nocturnal frequency is diminished after only a few irradiations, and a reduction in the size of the gland can soon be appreciated. Cystitis is a contra-indication to X ray treatment, as a severe exacerbation is likely to follow the application of the rays.

Technique.

I use only one port of entry—the perineum. The treatment may be given with the patient lying on his side on a couch, but I have found it more convenient to use a special stool, like a high office stool, which can be placed over the X ray tube. In the seat is a circular aperture, 4½ inches in diameter, through which the rays are directed. When the patient is seated on the stool the perineum can be accurately centred and the cheeks of the buttocks easily separated and maintained in position. The testicles are protected by a layer of lead rubber fixed to the seat.

The best results are obtained with rays of moderate hardness in divided doses. I use an 8-inch equivalent spark gap with 2–3 mm. aluminium and ¼-inch boiler felt as filters. Six doses of 1/6 B. are given over a fortnight, and the treatment is repeated at the end of six weeks. Two or three series are usually sufficient, but I have many patients who come twice a year for a single course as a prophylactic against recurrence, even though they may not be worried at the time by frequency or other symptoms of enlargement.

Diathermy.

So far, only non-infective prostatitis has been considered. In cases of gonococcal prostatitis diathermy is the treatment to be adopted. Its value has been pointed out by E. P. Cumberbatch, whose experience and writings on the subject have been of the highest value. The rationale of the treatment depends upon the power of the diathermic current to destroy the bacilli *in situ*. The temperature which will kill the micro-organism is one which is harmless or even beneficial to the tissues.

For the modern technique we are also indebted to Dr. Cumberbatch. He has perfected electrodes containing a thermometer which registers the heat which exists, or has been produced, by the current at the junction of the instrument and the mucous membrane. The electrode is inserted in the rectum, so that the prostate gland rests upon the head of the electrode when the patient is lying on his back. The electrode is attached to one terminal of the diathermy machine and the other terminal is connected to the indifferent electrode, for which I use a metal pad placed on the abdomen. Cumberbatch uses a belt of sheet lead 3½ inches wide and 4 feet long. This "is placed around the pelvis and the overlapping ends are passed through a stout wire loop and bent back so that the belt holds firm and even contact with the skin." Whichever indifferent electrode be used, the current should be turned on and increased very slowly, a sensation of heat but not of pain should be produced; if the patient complains of pain the current should be reduced until he is absolutely comfortable. This will usually be at a temperature of 106° F. or slightly higher, though at the first treatment 104° or 105° F. should be the maximum. The treatment should be of 20 minutes' duration, and be repeated every other day.

With these three forms of treatment, and a sufficient intelligence on the part of the patient to obtain medical advice before it is too late, the different types and degrees of enlarged prostate will cease from troubling, and the middle-aged man will have his rest at night undisturbed.

ALEUKIA HÆMORRHAGICA: MYELOPHTHISIS.

WITH A REPORT OF A CASE.

BY W. J. S. REID, B.Sc., M.D. ABERD., M.R.C.P. LOND.,
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CASES showing a hæmorrhagic diathesis are extremely difficult to place in their proper groups, and although the diagnosis of purpura hæmorrhagica may be sufficient to label the case, I think attempts should be made to separate the groups. Frank[1] has described cases which he considers are worthy of a separate name and classification as aleukia hæmorrhagica, and this case seems to correspond with those he describes.

The patient was 20 years old, a plasterer.

Family History.—Father and mother alive and well. No history of any blood trouble. Two brothers alive—perfectly healthy, but pale and anæmic-looking. Mother is also pale, and sons "took after her" in appearance. No history of any illnesses.

Previous History.—Perfectly healthy. Never lost a day's work through illness, and was a particularly energetic and efficient worker in his father's employ.

Present Illness.—Eighteen days before consulting his doctor he felt a little out of sorts, languid and vaguely tired. He noticed a few spots, like small blood vesicles, under the skin, but continued his work for a fortnight. At the end of this time the spots had faded, but a few more appeared and his urine contained blood. His doctor sent him to bed. There was a small subconjunctival hæmorrhage and some oozing from the fauces. He had a small superficial cut on the left middle finger which had not healed as quickly as usual, but he and his father were positive that the spots preceded this by 10 or 12 days, during which he continued work. When I saw him, in consultation with Dr. G. Ferguson, of Oldham, he was pale and coughing up blood. Blood was oozing from the fauces, which showed much swelling and gangrenous-looking clot. The cut on the finger was covered by gangrenous clot. The blood had reappeared in the urine. He was given calcium lactate and two injections of normal horse serum of 20 c.cm. each, which failed to control the hæmorrhage. He was admitted to hospital next morning, when he was extremely pale and practically moribund. Blood was still oozing from the fauces and anterior nares and from the lower lip.

Blood Examination.—Red cells 1,200,000 per c.mm. No nucleated cells. Hæmoglobin index 0·8. Anisocytosis. No basophilic punctation. No polychromasia. White cells 1750 per c.mm. Polymorphonuclears about 9 per cent. Small lymphocytes 84 per cent. Large lymphocytes 4 per cent. Myelocytes and promyelocytes 3 per cent. Thrombocytes—platelets—very much reduced in number, under 1/6 normal. Coagulation time not examined. Blood type II. Widal and Wassermann reactions negative. No tubercle bacilli in sputum or growth on culturing the blood, but the throat swab showed many rod-shaped organisms; no diphtheria. Van den Bergh's reaction negative, direct and indirect.

300 c.mm. of whole blood from the father were transfused into the patient and improvement took place at once. Bleeding ceased almost immediately, and in a few days the finger healed up and the throat condition cleared almost completely. The submaxillary lymphatic glands on both sides, which were enlarged, diminished rapidly. No enlarged glands were found anywhere else in the body, and no enlargement of the spleen was elicited by percussion, nor was the spleen palpable. The liver was not enlarged. Hæmic murmurs were present, but there was no signs of any organic heart lesion. The urine contained a slight trace of albumin, but no blood.

Treatment.—Gargle of acid carbolic for throat condition. Novarsenobenzol painted on the sloughing area. An acid mixture containing dilute hydrochloric acid thrice daily. Calcium lactate thrice daily. Intravenous injections of N.A.B. 0·45 g. at four days' interval. Three injections in all were given and no obvious effect was seen. Epistaxis began four days after the transfusion and was controlled by plugging the nares. Three days later some hæmaturia also occurred, and, as the epistaxis still continued, a second transfusion of 200 c.mm. was given, the father again being the donor.

Daily examination of the blood during this period showed no nucleated red cells. Hæmoglobin index never exceeded 0·9, and the white cells averaged 1000 per c.mm. with the granular cells never above 9 per cent. Thrombocytic count never improved. On the day following the second transfusion the index was still 0·9. The total white count had risen to 1250 per c.mm., but the granular leucocytes still formed only 9 per cent. of the total. Next day the white cells fell to 1050 per c.mm., and the hæmoglobin index was 1.

Four days later the patient showed petechiæ of the upper eyelids and became restless and vomited. Lumbar puncture yielded normal fluid. The restlessness changed gradually to delirium; the eyes deviated to the right and then to the left and the pupils became inactive; breathing became stertorous with left facial weakness; left arm flaccid, but not completely paralysed; left leg completely flaccid and paralysed; tendon reflexes absent, with extensor plantar response. In right leg tendon reflexes increased and extensor plantar response was present. After three hours patient expired. During the stay in hospital the patient had a temperature varying from normal to 104° F. on one occasion, but the average daily swing was from 99° to 102°.

Post-mortem Examination.

Brain: Large petechial hæmorrhages were present over the vault of both hemispheres near the longitudinal sinus. Multiple hæmorrhages all through the cerebral substance. No blood in the ventricles. Cerebellum studded with minute hæmorrhages all over its surface and through its substance.

Thorax: No lung disease; some œdema of both bases. Pleural cavities contained a small amount of blood-stained fluid. Some petechiæ on pleural surfaces.

Heart: Pericardial sac contained about 10 oz. of blood-stained fluid. Two large ecchymoses were present under the endocardium. All the valves were healthy and there was no sign of any endocarditis.

Spleen: Weighed 5 oz.; appearance normal. Culture taken—no growth. Malpighian corpuscles were not unduly prominent. No iron reaction.

Liver: Weighed 3 lb. Slightly fatty in appearance; capsules peeled normally. No perihepatitis. No iron reaction. In microscopic section slight necrosis seen in the centre of the lobules.

Gall-bladder and ducts healthy. Bile normal.

Kidneys appeared healthy except for some petechiæ in the substance and under the capsule. Adrenals normal.

Stomach and bowels were normal. A large old hæmatoma was found in the right iliac region behind the ascending colon and peritoneum. Appendix and caput cæcum healthy.

Thyroid normal. Lymphatic glands not enlarged except under the angles of the jaws; substance dark-coloured from blood resorption. Mediastinal glands not enlarged.

Bone-marrow: No red marrow present in humerus (upper end) or femur (upper end) or in sternum; substance cream-coloured in appearance. Medulla under microscope showed a complete absence of normal red cells, and no nucleated red cells or megakaryocytes were seen. No phagocytosis observed. The predominant cells were lymphatic. Much fat was present.

Summary of Case.

The striking features of this case are: the comparatively sudden onset of the illness and the complete absence of previous history of blood disease, or, in fact, of serious disease of any kind; the acuteness of the condition once started; the profuse hæmorrhages into the tissues and especially from the fauces, and the continued raised swinging temperature. Diagnosis is impossible in such a case without careful blood examination, and this places the condition within the group of diseases labelled aplastic anæmia. The case, clinically, gives the impression of an acute infective condition, which it may have been, but certain factors are against this. No organism could be isolated from blood culture and none from the spleen post mortem. The rise in temperature was definitely a later phenomenon than the petechial hæmorrhages. The foul condition of throat and lips, and of the small wound on the left middle finger, were at least a fortnight later than the petechiæ. The spleen was not enlarged and there was no enlargement of the lymph glands with the exception of the submaxillary glands, and this swelling was definitely a result of blood resorption and local infective material. Moreover, should an organism be isolated from the blood in such a case, it is by no means certain that it can be put down as the cause of the condition. Organisms are not uncommonly found before death, and in cases like that described, where the granular leucocytes are reduced to a minimum, organisms might exist in the blood as a result, and not necessarily as a cause of the agranulocytosis, which is really a breach of one of the body's defences.

Aplastic Anæmia.

"Aplastic anæmia," according to Hurst,[2]

> "is the name given to a rare condition in which the bone-marrow cells cease to produce blood corpuscles in sufficient quantity to compensate for their destruction. In very rare cases it appears to be a primary condition. More frequently it is secondary to a primary hæmolytic anæmia in which the over-activity, which is the normal response to both hæmolytic and hæmorrhagic anæmia, leads to exhaustion; possibly the toxæmia, which is the cause of the excessive hæmolysis, also damages the bone-marrow. Primary aplastic anæmia is characterised by the absence of nucleated red cells or other evidence of activity of the bone-marrow in response to the anæmia."

In this description the author may have had chiefly in mind the red-cell-forming function of the bone-marrow, but when all the functions are taken into consideration the definition is very sound. The division of primary from secondary aplastic anæmia is evident, but further subdivision is necessary to distinguish the cases which compose the groups, as they exhibit very diverse clinical pictures. The function of the bone-marrow in health is the production of cells of various kinds, and the circulating blood may be regarded roughly as the mirror of its efficiency. The cells produced normally by the bone-marrow are the erythrocytes, the granular leucocytes of various kinds, and the thrombocytes, the so-called platelets. The work of Wright, to which very wide, if not universal, recognition has been accorded, showed that the thrombocytes are the product of the megakaryocytic cells of the bone-marrow. The old ideas that they were artefacts, or extruded or separated particles of the other cells of the blood, are untenable. The function of bone-marrow may be regulated by a hormone, as is tentatively advanced by Hurst. Where the hormone over-stimulates, the result is one of several conditions—e.g., polycythæmia rubra, or myeloid leukæmia; where the hormone is deficient we get aplastic anæmia. The theory is attractive in its simplicity and helpful, but it is merely a hypothesis, and hardly explains the selectivity of the hormone in its control over the production of the various cells. The truth is that the bone-marrow can be impaired or stimulated in some, or all, of its functions.

Frank,[1] in 1915, described a disease-picture, in which all the cell-forming functions of the marrow were reduced very gravely, and there was a profuse hæmorrhage. This he regarded as a separate disease, and gave it the name aleukia hæmorrhagica or myelophthisis. Schulz and Friedemann,[3] in 1922, described a condition which was also an aplastic anæmia with reduction of the granular cells in the blood with, however, glandular and splenic enlargement, but without the hæmorrhagic tendencies of the other. They named the condition agranulocytosis. Koehler [4] has fully described three cases of the aplastic anæmia type, two of which showed severe lack of all the marrow-formed elements of blood. Erythropenia, leucopenia, with relative lymphocytosis, and thrombopenia were present, and a prominent clinical feature was hæmorrhage from the mouth and fauces. In the third case the erythrocytes and thrombocytes were not reduced much from normal, and no hæmorrhages occurred. All three had raised temperatures and gave the impression of infection; no organisms were found, however, to explain the condition. Ellmer [5] has reported a case which agrees with the picture of aleukia hæmorrhagica as given by Frank and by Koehler, and with the picture of the case here reported. Schulz and Friedemann insist on the absence of thrombopenia and hæmorrhages in their description of the condition which they term agranulocytosis. This is most probably not a disease sui generis, but a stage of a disease, probably an infection leading to partial exhaustion of the functions of the marrow, of which the granular leucocytic-forming function seems to bear the brunt.

In the case now reported all the cell-forming functions have been disastrously affected, the only cells which exist in the blood in anything approaching normal condition and quantity being the lymphocytes, and they do not have their origin in the bone-marrow. The essence of the aleukia hæmorrhagica (which descriptive name may be used till ætiology is better known) is that all the functions of the bone-marrow are severely affected and hæmorrhage takes place from the fauces, which seems to be a site of election, but the hæmorrhages may be general. A raised temperature always accompanies the condition. It is a disease of unknown causation, and naturally can only be diagnosed after a very careful examination of the history of each case. Morawitz,[6] for instance, has reported a case of aplastic anæmia following typhoid fever, and Schilling [7] one case following sprue. One of the essential features of aleukia hæmorrhagica is the thrombopenia, which is associated with the hæmorrhages. This is quite in line with the modern conception that the thrombocytes are a great factor in influencing the coagulability of the blood. The faucial condition in the case under my care—of oozing and necrotic membrane formation—had, in my opinion, the same causation as the other hæmorrhages in the body, and was the result and not the cause of the blood condition.

Benzol stands out as the most frequent cause of injury of the bone-marrow, so much so that it has been introduced by Korányi in an attempt to reduce the number of granular cells in myeloid leukæmia, but given up because of the impossibility of controlling its effects. Radio-active thorium X has been used by von Plesch and Falta for the same purpose, and given up for the same reasons—unreliability of action and impossibility of control. Over-response to Rontgen rays had produced the condition of aleukia hæmorrhagica, as recorded by Decastello, Ross,[8] Frank, and Whitby and Jackson.[9]

Treatment.

This is at best palliative. In view of the destructive changes in the marrow it cannot be otherwise. Where the cause is known, its removal, as in the case of benzol and X rays, is followed by regeneration unless the condition has gone too far. Where, however, the ætiology is unknown—i.e., in the primary essential aleukia hæmorrhagica—nothing seems to be of any service. Transfusion, as in my case, may cause a tremendous improvement for a little time—it brings the patient back almost from the dead—but at best its effect is only temporary. Removal of the spleen has been recommended for primary pernicious anæmia by Hoff,[10] Decastello,[11] Klemperer, and Hirschfeld,[12] Walterhöfer and Schramm,[13] and of late has been practised in this country in hæmorrhagic conditions where platelets are reduced to a minimum. In aleukia hæmorrhagica the reasons for the extirpation of the spleen, which are valid in both the above conditions, are present and cogent, but after serious consideration—there being no manifest enlargement of the organ—I decided against the operation. With a case less acutely ill the proceeding might be tried.

Summary.

The case described showed the following features. (1) An illness of fairly acute onset with petechial hæmorrhages—later hæmorrhages from the fauces and from the kidney. Death was due to hæmorrhages into the brain. (2) Temperature of septic type but later in onset than petechiæ. (3) No signs of regeneration in spite of severe anæmia due to hæmorrhages. (4) Leucopenia was present, granular leucocytes were practically absent from the circulating blood, and small lymphocytes formed a very large proportion of the total white cells present. (5) Reduction of thrombocytes to a minimum. (6) Absence of splenic and lymph gland enlargement. (7) Bone-marrow, examined post mortem, showed absence of erythrocytes, erythroblastic cells, megakaryocytic cells, and granular cells.

The condition is a clearly defined clinical picture and should be considered as a separate entity—aleukia hæmorrhagica or myelophthisis—and, pending further investigation, forms a subclass of primary aplastic anæmia.

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"PAY-BEDS" AT THE ROYAL NORTHERN HOSPITAL. An anonymous supporter of this hospital has promised to give £35,000 towards the erection of a wing for pay-beds on the lines suggested by the report of the King's Fund on condition that an equivalent sum is raised before the end of the year. The Royal Northern claims to have been the first of the great London hospitals to provide these facilities. The same donor has given £1500 for the purchase of radium and £700 for a new electric lift.

Clinical and Laboratory Notes.

CEREBRAL EMBOLISM

DUE TO AN UNUNITED FRACTURE OF THE CLAVICLE AND SUBCLAVIAN THROMBOSIS.

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AND
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THE following case, though unquestionably rare, is of importance because it establishes beyond doubt the manner in which cerebral lesions are occasionally caused by bony abnormalities at the root of the neck, and in particular by cervical rib.

The patient was a woman of 41 who came to the out-patient department complaining of pain and weakness in the right hand and forearm, made worse by movement. It had lasted some months and was slowly getting worse. The hand was cold and bluish and no pulse could be felt anywhere in the limb. On examining the neck the right clavicle appeared to be fractured. She was unaware that she had fractured her clavicle, but she was an epileptic, though she had had no fit for several years. The Wassermann reaction was negative, and there was no evidence of any central nervous lesion. The radiogram showed quite clearly an ununited fracture of the right clavicle. It was suggested that the condition might be congenital, but if that had been the case the two fragments would have been in a line, which they obviously were not.

The case at once recalled that about two years ago at a clinical meeting of the Neurological Section of the Royal Society of Medicine, Dr. C. P. Symonds showed two cases of left hemiplegia associated with a cervical rib on the right side, and absence of any pulse in the right upper limb. The explanation suggested was that the pressure of the cervical rib on the subclavian artery had led to thrombosis, and that the thrombus had extended backwards to the point of junction of the right common carotid, and a portion of it, becoming detached, had formed an embolus in one of the branches of the left middle cerebral artery. If this explanation were the true one there was a risk of a similar occurrence in this case, and a surgical colleague was consulted as to whether any operation was advisable. Arrangements were made for the patient to come into hospital, but before anything could be done an embolus occurred. She was taken suddenly ill with pain in the head and throat, vomited, and said she could not see. She gradually became unconscious and incontinent. At first there was some weakness of the right lower face, but later this spread to the left side, which was blown out more than the right on expiration, and the left arm and leg became paralysed. Some movement still occurred in the limbs of the right side on stimulation. The plantar reflex on the left side was extensor, on the right flexor. The knee- and ankle-jerks were only just obtainable. The abdominal reflexes were absent. The coma became deeper, with paralysis of all four limbs, the temperature rose to 105° F., and she died seven days after the first onset.

Pathological Findings.

A full autopsy was performed upon this case in the usual manner and the findings recorded. For the sake of correlation with the clinical picture, we shall describe the pathological changes in the order in which we consider they arose.

Right Clavicle.—An old-standing ununited fracture at the junction of the middle and outer thirds was present, with fibrous union and the formation of a false joint. The free ends were quite smooth and were displaced backwards and slightly downwards towards the right subclavian artery.

The Systemic Circulation.—The arch of the aorta, innominate, and right subclavian arteries were carefully dissected out in situ, and upon opening these vessels an organised and very adherent thrombus was found, occupying the first and second parts of the subclavian. This thrombus commenced about ⅜ in. distal to the division of the innominate into the right common carotid and subclavian arteries, and extended along the latter for a distance of 1½ in. The third part of the subclavian appeared free from thrombosis, but commencing at the origin of the circumflex another large adherent thrombus was found occupying

¾ in. of the axillary artery. Beyond this point no further thrombosis was found either in the brachial or radial arteries of that side. Comparison of the right and left brachial arteries showed narrowing of the lumen of the vessel on the right side. The aorta, innominate and right and left carotid arteries were free from antemortem clot. The thoracic and abdominal viscera exhibited no important *pathological changes.*

The brain, together with its vessels at the base, was removed carefully, placed in 10 per cent. formalin to harden and then examined. A well-marked embolus was found at the division of the basilar artery into its terminal branches, and microscopical examination showed this to consist of partly digested fibrin with but few leucocytes and practically no recognisable red cells; it was obviously of antemortem origin. To naked-eye examination there seemed little obvious softening in the pons, crura, or occipital lobes, but histological examination of these various areas showed well-marked softening to the extent of extensive necrosis in the upper and mid pons and in the crura. We were unable to demonstrate a similar condition in the occipital lobes.

These findings, taken in conjunction with the clinical picture, suggest that the right clavicle (fractured no doubt during an epileptic fit and unnoticed by the patient) had at the time of the fracture or since, caused damage to the right subclavian artery resulting in thrombosis. The resultant embolus in the basilar artery is then readily explained by the escape of a fragment of the thrombus up the right vertebral artery, and this would seem to be the only explanation.

This case is obviously analogous to the two cases of cervical rib reported by Symonds,[1] although the actual cause was different; and it demonstrates that thrombosis of the subclavian followed by embolism of one of the cerebral arteries is the sequence of events in such cases, and so far as we are aware this had not been actually demonstrated by autopsy before. The thrombus in the subclavian had evidently existed already for several months. The practical point which emerges is that such conditions, though very rare, are liable to lead to cerebral embolism, and this liability emphasises the importance of immediate surgical intervention in those cases where cervical ribs or analogous conditions are showing signs of compressing the subclavian.

EPHEDRINE AND EPHETONIN.

By F. R. Curtis, M.B., Ch.B., M.Sc. Leeds.

(From the Department of Physiology, University of London, King's College.)

Ephedrine and ephetonin are now being fairly extensively used in the treatment of asthma, for they produce dilatation of the bronchi in the same way as adrenalin, though their effect lasts much longer than that of the latter. They are optical isomers, having the empirical formula $C_6H_5.CHOH.CH.CH_3.NH.CH_3$. The former is lævo-rotatory, and occurs in Ma Huang (*Ephedra vulgaris*); the latter is optically inactive, and has been synthesised in the laboratories of E. Merck, of Darmstadt, Germany.

Recently it was stated by Kreitmair[1] that ephetonin is as active, weight for weight, as ephedrine, in spite of the fact that ephetonin contains 50 per cent. of dextro-rotatory ephedrine, which is almost devoid of activity. These findings are not consistent with expectations derived from our knowledge of the behaviour of other optically active substances, as, for example, the hyoscyamines and adrenalin. Chen,[2] while admitting a qualitative similarity between ephedrine and synthetic ephedrine (ephetonin), found that in man the latter does not produce nearly so marked an effect on the blood pressure as ephedrine.

The experiments on which Kreitmair based his conclusions regarding the comparative activities of ephedrine and ephetonin are open to criticism. His method was to determine the relative effects on the blood pressure of decapitated cats of small doses of the two substances, the doses employed being 0·05 mg. per kilo.

Now, as Barger and Dale[3] pointed out, in the case of the relatively inactive amines, such small doses are quite unreliable quantitatively. Further, Chen and Meek[4] showed that ephedrine produces a transient tolerance, and I have found it impossible to obtain equal rises of blood pressure even using equal doses of the same substance. Chen regarded any attempt to settle the question by experimental methods as impracticable, but this paper sets forth the results of what may be called a statistical method of approaching the problem.

Cats, with brain and medulla destroyed, were employed as test animals, and the blood pressure was recorded by means of a mercury manometer attached to a cannula in a carotid artery. Advantage was taken of the fact that after small doses of adrenalin there appears to be very rapid recovery of the circulatory system to its previous state. Accordingly, a series of 12 cats was divided into three groups, A, B, and C, of four cats each. Each cat received as a first injection 0·4 c.cm. of a 1/10,000 solution of adrenalin hydrochloride. The animals of group A then received 4 mg. of ephetonin, those in Group B 2 mg. of ephedrine, and those in Group C 2 mg. of ephetonin. After each injection of adrenalin, ephetonin, or ephedrine, the rise of blood pressure was measured in mms. of mercury. It was then possible to obtain a ratio between the effects produced by adrenalin and ephedrine, or ephetonin. The following tables give the results obtained.

Group A.

—	Rise after adrenalin in mm. Hg.	Rise after ephetonin in mm. Hg.	$\frac{\text{Adrenalin rise.}}{\text{Ephetonin rise.}}$
Cat 1.. ..	96	86	1·1
Cat 2.. ..	146	132	1·1
Cat 3.. ..	92	64	1·4
Cat 4.. ..	115	132	0·8
Average ..	112	103	1·1

Group B.

—	Rise after adrenalin in mm. Hg.	Rise after ephedrine in mm. Hg.	$\frac{\text{Adrenalin rise.}}{\text{Ephedrine rise.}}$
Cat 1.. ..	136	120	1·1
Cat 2.. ..	124	130	0·9
Cat 3.. ..	138	124	1·1
Cat 4.. ..	128	108	1·2
Average..	131	120	1·1

Group C.

—	Rise after adrenalin in mm. Hg.	Rise after ephetonin in mm. Hg.	$\frac{\text{Adrenalin rise.}}{\text{Ephetonin rise.}}$
Cat 1.. ..	122	72	1·7
Cat 2.. ..	124	62	2·0
Cat 3.. ..	84	32	2·6
Cat 4.. ..	140	62	2·3
Average..	118	57	2·15

It is hardly necessary to point out that there may normally be quite considerable differences in the pressor responses of the different animals as expressed in mm. of mercury. For that reason adrenalin was used as a sort of index of the intensity of the circulatory reaction as compared with that produced by ephedrine or ephetonin.

From the tables it will be seen that compared with adrenalin, 4 mg. of ephetonin and 2 mg. of ephedrine give an equivalent effect, as would be expected from the fact that 4 mg. of ephetonin contain 2 mg. of ephedrine and 2 mg. of inactive dextro-ephedrine. The result receives further substantiation in the third table, where it is seen that 2 mg. of ephetonin (containing actually only 1 mg. of l-ephedrine) produces half the effect of 2 mg. of ephedrine.

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[1] Brain, June, 1927, l., 259.

[1] [Footnote for Kreitmair continues on a following page]

Summary.

Experimental evidence is submitted to show that ephedrine is approximately twice as active as ephetonin.

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Medical Societies.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.

ANNUAL GENERAL MEETING.

THE eighty-seventh annual meeting of this Association took place on July 11th, 12th, and 13th at the West Riding Mental Hospital, Wakefield, Yorks, under the presidency of Prof. J. SHAW BOLTON.

Foreign psychiatric societies were represented by Dr. E. N. Brush (U.S.A.), Prof. Wimmer (Denmark), and W. Hans Evensen (Norway).

At the business meeting the following were elected honorary members: Dr. C. Hubert Bond. C.B.E., Dr. Eugen Bleuler (Zurich) and the Rt. Hon. Hugh Macmillan. P.C., K.C. The corresponding members elected were: Dr. Malcolm A. Bliss (St. Louis, U.S.A.), Dr. C. O. Ariens Kappers (Amsterdam). Dr. George H. Kirby (New York). Dr. Giacomo Pighini (Reggio, Emelia. Italy). and Prof. August Wimmer, (University of Copenhagen). Prof. C. E. Spearman was appointed the Maudsley lecturer for 1929.

The Gaskell gold medal and prize for 1927 was presented to Dr. Elizabeth Casson and that for 1928 was awarded to Dr. F. R. Martin. It was announced that H.R.H. Princess Mary, Viscountess Lascelles had been pleased to signify her willingness to accept the Association's nursing medal in gold and the certificate in mental nursing (honorary).

Prof. SHAW BOLTON took for the subject of his presidential address

The Evolution of a Mental Hospital: Wakefield, 1818–1928.

He said it was 19 years since the hospital provided a President of the Association, in the person of Dr. Bevan-Lewis. Wakefield could claim to be a mother of asylums, and it had reached a distinction accorded to but few. The first Wakefield Asylum opened in 1818. In 1853 the second was added, which accommodated 150 patients. The third was the modern building. Sir William Ellis who was the first director was afterwards at Hanwell. The President quoted at length from the old regulations. some of which showed much foresight, while others would now be regarded as humorous. The director was the superior officer, and he also acted as apothecary, surgeon, steward, and treasurer. Originally two visiting surgeons and two visiting physicians were appointed, but in 1821, probably on account of the confusion resulting from dual control, the visiting magistrates much increased the powers of the director and diminished those of the physicians. In the minutes of July, 1857, there appears a reference to Dr. Henry Maudsley, who was then on the Wakefield staff, and one of the earliest workers in the Wakefield Laboratory was Sir James Crichton-Browne. The latter not only fostered research in the institution, but he did his best to promote a general medical interest in the work and administration of the hospital. The appointment of resident clinical assistants, unpaid but having free board, lodging, and tuition, dates from early times.

The President proceeded to sketch the various additions to buildings, and the improvements in administration and treatment which were carried out in the progress of the years, discussing at some length the question of punishment of patients for gross misdemeanours. He added that since he took office mechanical restraint and punishment had ceased, both in fact and in name. He declared that if he had the authority he would render restraint of all kinds not only illegal but criminal on the part of any individual who ordered it without having first experienced its effects on his own person. He drew attention to the close association of the mental hospital with the University of Leeds and the advantages accruing therefrom, making particular reference to the establishment of the pioneer diploma in Psychological Medicine.

Sir ROBERT ARMSTRONG-JONES proposed, and Dr. J. BRANDER (Bexley) seconded, a vote of thanks for the address.

On Thursday, July 12th, Dr. M. J. MCGRATH (Wakefield) opened the day's proceedings with a paper on a description of the steps taken in a mental hospital to prevent the spread of dysentery and allied infectious diseases. He said it was essential to have isolation wards for new admissions and infected cases. Infection of inmates occurred not only through infected cases transferred from other places, but from new members of the staff. Hence every fresh patient and each new member of the staff was submitted to a special physical examination for infections. Of 467 probationers 83 had to be rejected as a result of the examination. The organisation of this work had led to good results. It was insisted that an institution entirely free of dysentery was peculiarly liable to infection from without, particularly if a foreign strain were brought in. Investigations led to the conclusion that periodic temporary immunisation of institutions in this respect was constantly taking place.

In connexion with this subject the PRESIDENT read a part of his Presidential address, postponed from the previous day, describing the seriousness of some of the epidemics of dysentery which at various times in the past had afflicted the inmates. The precautions now taken to detect and when found to isolate and treat thoroughly a case of bad diarrhœa or dysentery were given in detail.

Other Communications.

Mr. A. L. HOWDEN (Wakefield) read a paper and demonstrated the bacteriological methods employed at the hospital in regard to the detection of dysentery and allied infectious diseases.

Dr. J. R. LORD (Horton) spoke in praise of the modern skilled laboratory assistant, and said this was the first occasion he recollected on which one had read a paper before the Association. He congratulated Mr. Howden on his paper and demonstration.

Dr. F. A. PICKWORTH (Birmingham) said that at the Birmingham Mental Hospitals, in addition to isolating those who showed a positive Widal, they treated likewise all who had had contact or relation with typhoid patients, or who showed infective organisms in the fæces.

Dr. F. R. P. TAYLOR (Hellingly) said that at Hellingly dysentery cases came among the patients transferred from other hospitals, and it was not until regular bacteriological examinations were made the rule that real good ensued, though isolation had been previously carried out.

Prof. J. W. MCLEOD (Leeds University) expressed his surprise that Shiga infection epidemics did not occur in mental hospitals. He dealt with a number of points in technique.

Dr. C. HUBERT BOND said these communications must have brought home to everyone the necessity of having a laboratory attached to mental hospitals.

Dr. J. I. RUSSELL (York) referred to the different types of dysentery and the difficulties of differentiation.

Dr. LL. WYNN JONES (lecturer in psychology, Leeds University) read a paper on an investigation into the significance of perseveration. He said there were five kinds of perseveration—sensory, motor, ideational, emotional, and conative. He dealt only with the first three.

Prof. B. A. McSwiney (Leeds University) contributed a paper on Physiology in Relation to Psychological Medicine. He said that the paucity of information on cerebral function in the text-books was due to absence of methods available to investigate the normal activity of the higher nerve centres. The explanations advanced often took no account of the function of the lower nervous system in bringing about the requisite coördination and relationship between the different organs of the body. If knowledge of the physiological factors controlling mental activity was to advance, the physiologist must continue to make measurements on structures which he was able to control, and carry out investigations in which he was able to isolate the disturbing factors. He illustrated his thesis by a number of examples, many of which were illuminated by the work of Sherrington and others.

Dr. Ian Suttie (Fife) read a paper on Neurotic Superstructures in Certain Psychoses. The paper consisted of an elaborate justification of the treatment of early cases by psycho-analysis, and illustrated well the degree of concentration and patience required for the successful pursuit of this method.

The President followed with a lantern demonstration of the stages the egg passed through in the germination of the chick, bringing out well the final mechanism which resulted in the emergence of the chick into the outer world.

On Friday, July 13th, Dr. K. C. Paddle (Wakefield) read a paper on Review of Blood Pressure in the Insane. It was based upon the careful examination of 920 male patients, care having been taken not to excite the patient before or at the time of the examination. The cases were divided into seven groups. Summarising his results, Dr. Paddle said that in melancholia 51 per cent. of cases had a subnormal blood pressure; in mania 51 per cent. had a subnormal pressure; in epilepsy 70 per cent. had a subnormal pressure. The average blood pressure in the insane varied according to the age. The majority of insane epileptics had a constantly low pressure independently of the frequency of the fits or the kind of epilepsy.

Dr. F. A. Pickworth (Birmingham) contributed a paper on variation in the agglutinin formation in mental hospital patients and its probable relation to focal sepsis. The main purpose of the communication was a consideration of how the system might be invaded by organisms which demanded a considerable production of antibodies to effect their destruction and removal from the system. The organisms normally present in the jejunum evidently migrated to higher levels, as shown by examination of over 200 cases. The inter-relation between focal sepsis and the variation in agglutinin formation of the insane probably occurred through the medium of a high intestinal sepsis caused by infection with paratyphoid or food-poisoning organisms.

Dr. J. F. Smyth (Wakefield) spoke on the relation of the *Spirochæta pallida* to the histological changes in dementia paralytica. He said that spirochætes were found in 75 per cent. of the cases; they were found most frequently in cases which ran a stormy course. The number of cases examined was 52. The most that could be hoped for under treatment was an arrest of the damaging process to the cortex.

Dr. John Brander (Bexley) discussed general paralysis of the insane as a clinical and pathological entity.

Prof. W. H. Maxwell Telling (Leeds University) spoke of the value of psychical research to the physician. He declared he had received great benefit from a study of psychic phenomena, and proceeded to review the present state of knowledge and the tendency in the profession concerning this subject. His own attitude was sympathetic towards such subjects as telepathy.

The concluding item was a demonstration by the President on cases of sense deprivation and the primary importance of the aural centres in the cortex cerebri.

ANNUAL CONGRESS OF THE ROYAL SANITARY INSTITUTE.

PLYMOUTH, JULY 16TH–21ST.

The inaugural meeting on Monday has already been touched upon. During the remainder of the week the work of the Congress was, as usual, divided up among many sections. The following notes deal with some of the points of special medical interest which arose in the course of the meetings.

Hygiene in Industry.

Mr. Ramsay MacDonald, in his presidential address to this Section, compared the worker with a delicate scientific instrument; the old fashion of putting him to do a job just as it came was now abandoned by everyone who had any common sense. Public health had the individual as its aim, but the community as its medium, and included both self-help and mutual aid. The work of bodies such as the National Institute of Industrial Psychology, the Medical Research Council, and the Industrial Fatigue Board, was putting industrial hygiene in its proper place as one of the most vital concerns of our country. We were still in the transition stage and did not wholeheartedly accept the doctrine that the conduct of industry is a national concern. The latest attempts by the General Council of the Trade Union Congress to explore the conditions of industrial peace were an essential contribution to the practical success of recent scientific investigations. In industry strains, fatigues, and worries were as poisonous to life as were disease germs. A close and detailed study of the use to which the human body is put in industry was needed. Mr. MacDonald gave many convincing illustrations from the experience of Dr. C. S. Myers, of unnecessary fatigue and waste of muscular effort in factories, which had been easily remedied with a little study. The temperature and ventilation of workshops affected not only physical condition but the nerves, as shown by temper, general ease, and happiness. It had been found, also, that men varied in their suitability for working with machines running at different speeds; of two men working side by side at similar machines one might be brought to the verge of nervous breakdown by inability to keep up, while the other might complain of boredom from the slowness of the pace. The hygienist was handicapped by the fear of the worker that industrial economy meant intensification of labour for him. The solution of all such problems was of immense importance to industry both as regards its economic working and its internal harmonies, and this department of research was essential for moulding our organisation of industrial and sociological relations into a coöperative concord.

International Preventive Medicine.

Dr. L. Rajchman, Medical Director and Secretary of the League of Nations Health Committee, in his presidential address to the Preventive Medicine Section, outlined the policy and methods which had been evolved by seven years' work on the part of leading men of many countries of all continents. He referred to the services of epidemiological intelligence and public health statistics, of technical publications, and of permanent liaison work with national sanitary administrations; to commissions at work and organisations in progress in many countries; and to investigations of many problems, including those of sleeping sickness in Equatorial Africa, small-pox and encephalitis in Northern Europe, leprosy in South America and the East, malaria throughout the world. Other hopeful enterprises included the practice of preventive methods by health insurance organisations, the adoption of common standards for sera and vaccines, and common lists of causes of death, and the study of preventable causes of infant mortality.

The Present Position of the Tuberculosis Problem.

Dr. F. J. H. Coutts (Ministry of Health), in opening this discussion, pointed out that the conspicuous fall in the mortality-rate from 1851 to 1910 was at the age-period 20–25 years. Since 1910 the greater decline had been at later age-periods, while at age-periods 15–20 and 20–25 there had been little reduction among males and an actual increase in the female mortality. This disquieting feature of the breakdown of young adults from tuberculosis needed elucidation and investigation in each district. Much further investigation was also needed of the supposed immunity acquired by children who suffered from peri-bronchial or other mild forms of tuberculosis. He thought that direct measures had played their part in the decline of tuberculosis and quoted intensive experiments in Sweden and the U.S.A. in confirmation. As regards treatment, good results were being obtained from the induction of artificial pneumothorax and thoracoplasty, and the greatest sphere of usefulness of artificial light treatment was in the treatment of lupus.

Dr. Marcus Paterson said that we taught the infectious consumptive how to avoid infecting his own family and how to lead a healthy life, but we did not educate the public in the fact that the use of a pocket spittoon by the consumptive was a protection for them. Medical students, except in Edinburgh, did not receive adequate instruction in the management and treatment of tuberculosis.

Shell-fish.

The cultivation and marketing of shell-fish in good condition was dealt with from the point of view of the trade, of the Fishmongers Company, and of the medical officer of health. There appeared to be general agreement as to the great value of the bacteriological tests originated by the Fishmongers Company, coupled with inspection of the beds and an intimate knowledge of the topographical conditions.

Mr. James Y. Johnston (Prime Warden of the Company) described the action taken by his Company to organise an influential deputation to the Government, which had resulted in the appointment of special committees, one for investigation of the whole question of pollution of rivers and estuaries, and the other for instituting research as to sewage effluents.

Many medical officers of health spoke of the ready help afforded them by the Fishmongers Company in the case of doubtful shell-fish, and it was pointed out by Prof. J. W. H. Eyre that the Company receives samples for testing from all parts of the country, and that the information in its possession as to samples and beds is freely available both for the trade and for medical officers of health.

Housing.

The discussion on housing was opened by Councillor Albert Webb, chairman of the Plymouth Housing Committee, who dealt chiefly with methods of house-purchase, the renovation of existing privately owned houses, and the clearance of congested areas. He firmly believed in occupier-owners and, during the last three years, the Corporation had advanced £450,000 to enable tenants of limited means to become owners. The Corporation borrowed at 4¾ per cent., and lent at 5¼ per cent., and the ½ per cent. paid management expenses, so that this scheme was self-supporting.

The Corporation had also provided for the sale of municipal houses to existing tenants on easy terms. The only initial outlay for the tenant was a deposit of £10 and the cost of transfer and mortgage deed. For example, a "non-parlour" house, rented at 8s. 9*d*. per week, could be purchased by the payment of 9s. 6*d*. per week for 30 years.

The Corporation had renovated 147 properties under Section 3 of the 1925 Act, at a cost to the owners of £25,000, to be recovered from them in repayments spread over ten years. Most of this work was done by agreement with the owners. They had a new scheme, which was provisionally approved by the Ministry of Health, for reconditioning certain houses in a congested area and demolishing the remainder. Such a scheme might to some extent cater for the casual worker. An experiment in providing small houses for special cases was being considered.

Several speakers congratulated Councillor Webb on the housing activities of Plymouth. From all quarters came the admission that up to now nothing had been possible in the provision of houses for the poorest class and the low-paid worker with a large family.

Dr. C. Lander (Devonport) thought they should recognise that economic rents were frankly impossible, and that housing should be regarded as a State social service. There must be a subsidy and it should come from the National Exchequer. A valuable contribution came from Miss J. M. Upcott, housing manager to the Chesterfield Town Council, on the management of municipal housing estates on "Octavia Hill" lines. She advocated a gradual preparation and education of slum tenants for their removal to better quarters, with perhaps a transition period spent in reconditioned houses.

Milk.

Dr. W. G. Savage opened this discussion with a paper on Milk and Tuberculosis. He regarded the grading of milk as a "magnificent educational gesture." The Tuberculosis Order, as at present worked, was of no value whatever. It would be a continuing expense, with no reduction of bovine tuberculosis and no protection to the public from tuberculous milk. Before the country was committed to the expense of routine veterinary inspection of milk herds, they should be quite clear in their minds as to what they expected this inspection to accomplish and draw up a carefully thought-out scheme, including the coöperation of the dairy farmers.

In the discussion the case for dried milk was put by Mr. F. O. Morris, the case for pasteurisation by Dr. S. G. Moore, and there was a general admission that the eradication of tubercle was so remote that some method of rendering raw milk safe must be adopted in the meantime.

Immunity Methods in Scarlet Fever and Measles.

Dr. R. A. O'Brien showed that the Dick test, the Schultz-Charlton test, active immunisation, and the use of antitoxin have been firmly established in the case of scarlet fever. There was still lacking an antiserum to combat septic conditions which had already appeared, and the problem of the convalescent carrier or return case was unsolved. Convalescents were discharged with hæmolytic streptococci in their throats indistinguishable by any available test from scarlet fever streptococci, but it was not as yet practicable to ask for negative cultures before release, and the medical officer could only adhere to the rule of sending out cases after the restoration of normal health with an absence of discharges from mucous membranes. As regards measles, the utility of the serum of convalescents for conferring either temporary complete protection or for giving active lasting immunity, according to the date after exposure to infection on which the dose was given, was now accepted. The problem for sanitary authorities was to provide and maintain a supply of this serum and to make appeals for volunteer donors.

Dr. W. A. Lethem (Ministry of Health) pointed out that though last year measles killed five times as many children as scarlet fever, the public was still not convinced of its dangers. Schemes for the supply of the serum of convalescents were in operation in several towns in France, Germany, and the U.S.A. Dr. Lethem outlined a scheme for districts in this country. The serum was effective from the eighth to the fourteenth day after the temperature fell. It was preferable to obtain it from adults who could easily spare enough to immunise some 30 children. Adults were usually treated at home by general practitioners. The medical officer of health should hold a meeting with practitioners to explain the scheme and seek their coöperation in obtaining donors. He should select a laboratory and arrange for an expert from the laboratory to collect the blood. The serum remained potent for many months, if kept at a low temperature. He thought donors would be readily obtained when they understood the great benefit they were conferring on the community without harm to themselves. If the supply was limited, its use should be restricted to children for whom an attack of measles might be a matter of extreme gravity: if more ample, it might be used for all very young children who had been exposed to infection.

Dr. W. T. Benson (Edinburgh), Dr. J. Parlane Kinloch (Aberdeen), and Dr. E. H. R. Harries (Birmingham) confirmed from their experience the views expressed by Dr. O'Brien and Dr. Lethem.

Nursery Schools.

Miss Margaret McMillan described, with the aid of lantern slides, the wonderful changes effected in the pre-school children from the congested areas of Deptford and Greenwich by attendance at the Rachel McMillan open-air garden school. She explained the methods adopted and claimed that by economical management and simple buildings the cost is less than that of an ordinary infant school. The parents contribute, but in return the children get three good meals a day. Nursery schools may be a confession of failure—of failure under existing conditions to secure a good home for each child with reasonable access to playground or garden—but the practical sanitarian acknowledges that congested areas in our industrial towns will hardly be removed in one generation and that there is, in the meantime, a clamant need for many more "Rachel McMillan" schools run by enthusiasts like Margaret McMillan. It is not surprising, therefore, that the resolution, in favour of more open-air nursery schools, and calling upon local authorities to make the nursery classes in the Fisher Act of 1918 operative without delay, met with general acceptance by the Section. Prof. Winifred Cullis, in seconding, emphasised the fact that during these years the foundations of health, character, and education were laid, and that children who had been under the supervision of welfare centres showed fewer defects when they reached the school-entrance age.—Dr. Mabel G. Brodie also testified to the value of such nursery schools; and Dr. E. G. Annis (M.O.H., Greenwich) confessed that Miss McMillan's work for the children of his borough had converted him from a sceptic into a firm believer. The open-air régime and care taken quite prevented outbreaks of infectious disease in the school.

Light Treatment.

Dr. Albert Eidinow described the biological actions of light, while Dr. H. Stanley Banks (Leicester) and Dr. W. Allen Daley (Hull) dealt with the practical application of light treatment to public health work.

Dr. F. G. Bushnell (Devon) spoke on uses and abuses of light treatment, and all the three last-mentioned speakers sounded a note of warning as to exaggerated statements and commercial exploitation of this treatment.

Dr. Daley pointed out, from his experience, the danger of this treatment being added to the list of so-called medical baths and employed without proper medical supervision. He summed up by expressing the opinion that light treatment was a permanent addition to the disease-preventing and disease-curing methods which should be provided by a local authority, particularly for the sun-starved denizens of our towns, that the use of irradiated foodstuffs was not a substitute for light clinics; and that the provision of light treatment by baths committees should be watched with great care.—A resolution was adopted recommending the establishment of public sun and air bathing facilities by local authorities especially for children.

Health of Seamen.

Fleet-Surgeon W. E. Home said that during this year, for the first time, fairly accurate statistics of the mortality of seamen, occupied and retired, had been published by the Registrar-General. Their mortality from disease was 75 per cent., and from injury five times greater than those of "all males." The cubic space of British seamen had been increased from 72 cub. ft. to 120 cub. ft., while that of the lascars had remained at 72 cub. ft. Coincidently, the phthisis death-rate of British seamen had declined by 40 per cent., and that of the lascars only by 15 per cent. The seaman lived in his ship for 24 hours in the day, and his living accommodation should be passed by a health authority. Some of the seaman's needs were: care of water-supply, wash-places, good galleys, good w.c.'s, drying-rooms, and accommodation aft.—At a conference of port sanitary authorities, held on Thursday, July 19th, the following resolution was unanimously adopted:—

> That the Council of the Institute be recommended to direct the attention of the Government to the desirability of the care of the health of the men of the Merchant Service being placed in the charge of the Ministry of Health.

The motion was proposed by Fleet-Surgeon Home, and seconded by Alderman F. Askew, chairman, Hull and Goole Port Sanitary Authority, who together sent the motion up to the Council of the Institute, to get it on the agenda of the Conference. The motion was supported by Commissioner H. Miller, of the St. John's Ambulance Brigade, in an excellent speech, and its unanimous acceptance was ensured from the first.

National Health Insurance Service.

On the last day of the Conference Mr. Henry Lesser, in a presidential address, showed how financial considerations were retarding the proper development of the Service, and Mr. W. Gill Hodgson, clerk to the Liverpool Insurance Committee, expressed the opinion that the present scheme should be perfected by the addition of specialist and consultant services with laboratory aids and of dental treatment before any further classes of persons, such as dependants of insured persons, were brought in.

DONATIONS AND BEQUESTS.—Sir Henry Samman, Bart., of the Manor House, Willerby, Yorks, shipowner, left £23,000 for charity, including £10,000 to the Hull Infirmary, £5000 each to the Seamen's Mission, Hull, and the Henry Samman Chamber of Commerce Endowment, Hull, £1000 each to the Port of Hull Society Sailors' Orphan Homes, and to Hull Seamen's and General Orphanage, and £500 to Victoria Hospital for Children, Hull. —The Right Hon. Satyendra Prasanna, Baron Sinha of Raipur, of Delhi, India, and of London, left Rs.10,000 each to the hospital attached to the Belgatchia Medical College, the trustees of the Sadharan Brahmo Samaj of Cornwallis-street, Calcutta, the trustees of the Bhowanipur Sanmilani Brahmo Samaj, the Sambhunath Hospital, Bhowanipur, and the Calcutta Orphanage of Bulloram, Deys-street, Calcutta. And if he had not already made provision (as he had intended to do in his lifetime) for the maintenance of the Middle English School and Charitable Dispensary which he had built and for many years maintained at Raipur, then Rs.50,000 upon trust for investment and the income applied for such purpose.—Mrs. Emily Crossley, of Highgate, left £2000 to the Ancoats Hospital, Manchester, as to £1500 for the general maintenance of that hospital and £500 towards the general maintenance of the Convalescent Hospital at Warford, Cheshire, in connexion with the Ancoats Hospital.—Mr. Samuel Palmer Cooper, of Moseley, Birmingham, left £1000 each to the General Hospital, [illegible] the Birming- Birmingham, Queen's Hospital, [illegible] id to ham and Midland Free Hospital [illegible] and Dr. Barnardo's Homes; £500 ea[illegible] Midland Midland Eye Hospital, the Birmingham and Midland Homœopathic Hospital, the Birmingham Royal Institute for the Blind, the National Institution for the Blind, and the Children's Hospital, at Cold Ash, Newbury, if his niece, Mary Katherine Cooper, is matron there. After other bequests the ultimate residue of the property is left between the General Hospital, Birmingham, Queen's Hospital, Birmingham, the Birmingham and Midland Free Hospital for Children, and Dr. Barnardo's Homes.

Reviews and Notices of Books.

BIOLOGICAL INTRODUCTION TO THE STUDY OF NEUROLOGY AND PSYCHOPATHOLOGY.

Introduction biologique à l'étude de la neurologie et de la psychopathologie. By C. V. MONAKOW and R. MOURGUE. Paris: Félix Alcan. 1928. Pp. 416. Fr.80.

THOSE who endeavour to keep in touch with the philosophical background of biology are aware of the existence of a reaction against the confident mechanist and materialist theories of the last century. In the English-speaking world Prof. Whitehead, Prof. Lloyd Morgan, and General Smuts are among those now seeking to construct new biological concepts which shall be more adequate to explain the behaviour of living organisms. No biological hypothesis which aims at transcending pure mechanism can fail to be indebted to Bergson, who 30 years ago was a voice crying in a wilderness of determinism. Prof. von Monakow and Dr. Mourgue freely acknowledge this debt in the pages where they impugn current concepts in neurology and psychiatry on grounds which Bergson has rendered familiar. They state that pathological phenomena are considered in isolation from the organism; also that the existing conception of function is too static and ignores the time factor. They believe that evolution is not sufficiently recognised to be a qualitative as well as a quantitative change, and that language itself, owing to its mode of development, is unsuited to deal with the essential mobility of function. Owing to these disabilities modern neurology tends to see in pathological states of the nervous system no element save functional deficit, and does not take into account the compensatory efforts, evoked by injury from the organism, which distinguish living creatures from machines. To overcome these defects of method the authors find necessary new concepts which require new terms for their designation, and thus they introduce us to "klisis" and "ekklisis," "protodiakrisis," and "diaspasis," "hormétères" and "noohormétères," "syneidesis" and "hormè." The most important of these conceptions appear to be the two last named. "Syneidesis" is described as "conscience biologique" and is a principle of auto-regulation invoked to explain the efforts of an organism to compensate for its defects. "Hormè" is the undifferentiated drive from which instincts derive their impulsion and recalls Bergson's "élan vital."

Armed with these new weapons of thought Prof. von Monakow and Dr. Mourgue range over the whole realm of neural function from embryology to religion, and from the conception of causality to the permeability of the choroid plexuses. After an introductory chapter they trace the development of character in terms of the integration of instincts. The evolution of movement, orientation, and language is then considered. The authors next deal at length with disintegration of neural function, giving special consideration to aphasia, and severely criticising the theories of an anatomical localisation of speech "centres." Next come chapters devoted to the psychoneuroses and the psychoses, schizophrenia being taken as an example of the latter. The book concludes with a review of the evidence that abnormal permeability of the choroid plexuses plays a part in the ætiology of disease of the nervous system.

Criticism of this book is inevitably disarmed by the width of its scope, the laudability of its aim, and the ingenuousness of its title. The names of the authors are a sufficient guarantee that the theories developed are firmly based upon an expert knowledge of the histology of the nervous system and a wide clinical experience. That such authorities should be profoundly discontented with current physiopathological ideas is of considerable moment, and their attempt to provide a more truly biological basis for neurology and psychiatry cannot fail to be challenging and stimulating. How far they have succeeded in their object must be left to the decision of the individual reader. Those who are satisfied with a mechanistic physiology are unlikely to be led to alter their minds. Those who regard such concepts as inadequate to represent the living reality may perhaps find an effective substitute in "syneidesis" and its confrères. But many to whom such principles are incomprehensible will probably finish the book a little disheartened. Is it possible that owing to the structure of our minds and language we are of necessity condemned to employ scientific methods which can never tell us the whole truth about reality? Or may we hope with Prof. von Monakow and Dr. Mourgue that in time we shall succeed in forging new instruments of thought with which to enlarge our apprehension?

ANTHELMINTICS AND THEIR USES IN MEDICAL AND VETERINARY PRACTICE.

By R. N. CHOPRA, M.A., M.D. Cantab., Major I.M.S.; and ASA C. CHANDLER, M.Sc., Ph.D. London: Baillière, Tindall and Cox. 1928. With 5 plates and 65 figures in the text. Pp. xii.+291. 22*s.* 6*d.*

THIS book is written to display for medical and veterinary practitioners both recent and time-honoured methods of attacking helminths. The prime consideration in anthelmintic treatment, it is insisted, must be the patient's safety. The value or otherwise of diet and purgatives, the method of administration of the latter, and the criteria of cure are discussed. A chapter on helminthological considerations bears evidence of haste in preparation. The key which it contains, and which purports to deal, among other matters, with the commoner and more important adult nematodes parasitising man, is in many ways unsatisfactory. No mention is made of ascaris, trichuris, male threadworms, and the hookworms; the description of hydatid cysts seems to imply the necessary presence of scolices, and in the figures of ripe segments of *Tænia solium* and *T. saginata*, described as being drawn to scale, the scales are not correct. The statement that microfilariæ are injected by mosquitoes will not find general acceptance. Several proper names are confusingly misspelt. The chapter on correlation between the chemical composition and anthelmintic efficiency of drugs is a valuable one; full acknowledgement is made of the work of Caius and Mhaskar.

The use of various anthelmintics are considered in detail and this part of the book will be useful for purposes of reference. Most readers will turn to those drugs which are popular at the moment. It is suggested that carbon tetrachloride produces on the mucosa an anæsthetic protective action which limits absorption after doses of moderate size. The implication appears to be that small or divided doses must prove more dangerous than single doses of 3 to 4 c.cm. Evidence for this conclusion would be welcome. Commenting on the widely accepted explanation that poisoning attributed to this drug is really due to traces of carbon disulphide, the authors point out that this lacks laboratory evidence and that the dose of the carbon disulphide for a foal is 1 to 2 drachms. At the same time they accept the assumption that it is some sulphur compound which makes the drug toxic. The reservations which they advise in the administration of carbon tetrachloride entail a close personal examination of every patient. It is once more stated here that Schüffner and Vervoort advised oil of chenopodium in dosage of 3 c.cm.; reducing drops on the international dropper to cubic measurement, their dosage was really 1·2 c.cm. After noting that Ashford treated two million cases with thymol without a single fatality, the authors state that chenopodium and carbon tetrachloride are less dangerous than thymol for field work (though the records of neither approach in safety this cited example) and have largely supplanted thymol in the hands of most practitioners who have kept abreast of the times. We deprecate the implication that the many authorities who favour treatment by thymol are old-fashioned. The chapters on antimony and emetine used mainly in schistosomiasis, are valuable.

The book as a whole is uneven, but since it reflects the views of men who have had considerable experience in the use of anthelmintics it will be studied with interest by those practising in the tropics.

SHORT ESSAYS ON MEDICAL TOPICS.

By C. O. HAWTHORNE, M.D. London: John Bale, Sons and Danielsson, Ltd. 1928. Pp. 246. 4*s.* 6*d.*

THIS little book contains some 50 essays, from which it will be gathered that many of them are not longer than the average leading article. Hence, as the subjects dealt with vary extremely, not only in theme but in importance, there are places in which the author is driven to being arbitrary, for he has allowed himself so little space in which to explain his views and no space at all for argument with those who might differ from him. But we do not think that many will want to differ, for the author, in discussing some of the most important professional topics, has dealt with them fairly, brought out the salient points, and delivered well-balanced judgments.

SECTION-CUTTING.

An Introduction to the Technique of Section-Cutting. Edited by FRANCES M. BALLANTYNE, M.A., Assistant in the Zoology Department, University of Glasgow. Edinburgh: E. and S. Livingstone. 1928. Pp. 80. 3*s.*

THIS little book has been compiled from the notes of the late Mr. Peter Jamieson, for many years assistant in the department of zoology in the University of Glasgow. It sets forth clearly and briefly the basal technique of section-cutting, and will no doubt find a place in the junior student's library. It is, however, quite elementary, and while, within its limits, its teaching is admirable, it contains little more than the student can learn from an hour's personal instruction and a little practice. If a medical student decides to be content with this manual in place of a more ambitious work he should disregard the statement on p. 49 that formalin as a fixative is only satisfactory for such objects as the eggs of frogs and newts.

KALA-AZAR.

A Handbook for Students and Practitioners. Second edition. By L. EVERARD NAPIER, M.R.C.S., L.R.C.P. Lond., in charge of Kala-Azar Research, Calcutta School of Tropical Medicine. London: Humphrey Milford, Oxford University Press. 1927. Pp. 203.

To those who practise in England kala-azar is merely of academic interest; but to the student of tropical medicine this disease is of paramount importance, for it is one of the dramatic infections of the tropics of which our knowledge has made rapid strides during recent years. Only some 16 years ago kala-azar was regarded as inevitably fatal; and now we learn it is possible to predict a cure in over 90 per cent. of cases. The second edition of Napier's Kala-Azar is thus opportune. Into its 200 pages a vast amount of information is compressed. Especially valuable is the account of the minute epidemiological investigations which led up to the modern conception of the transmission of the disease by *Phlebotomus argentipes.* These demonstrate clearly what can be accomplished by systematically applied observations in a limited area such as the town of Calcutta. The tropical practitioner will welcome a reasoned account of the treatment of kala-azar by the newer pentavalent compounds of antimony; he will, moreover, appreciate the numerous clear illustrations and graphs and the exhaustive bibliography.

ANAEROBES.

Données récentes sur les microbes anaérobies et leur rôle en pathologie. By W. WEINBERG and B. GINSBOURG. Paris: Masson et Cie. 1927. Pp. 291. Fr.35.

Weinberg and his colleague have performed a great service to bacteriologists in publishing this review of the work on anaerobes published between 1918 and 1926. The review is accurate, comprehensive, and is informed throughout with the authors' profound knowledge of the subject. The bibliography contains some 1400 references. If there is a fault it is that certain organisms are included which may fail to stand the test of further investigation; but this is better than omitting any which subsequently prove to be of importance. Bacteriologists will be grateful to the authors for such an excellent work of reference.

JOURNALS.

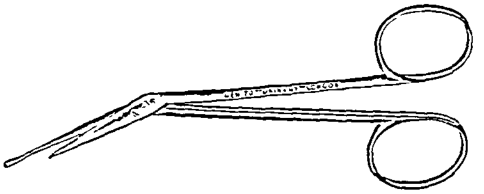
THE CRIPPLES' JOURNAL. Vol. V. No. 17. July, 1928. 1*s.* 6*d.*—The publication of the April number of this journal closed four years of work, and the present issue inaugurates the passing of the journal from being the official organ of the Central Council for the Care of Cripples into an independent publication run by its own advisory council and with definitely international aspirations. This advisory council, presided over by Sir Robert Jones, will be composed as follows: Dame Georgina Buller, Dame Agnes Hunt, Mrs. Townsend, Sir William Wheeler, Sir John Lynn Thomas, Rev. Ratcliffe Barnett, Sir William Lawrence, Bart., and Mr. A. H. Wood (Great Britain), Mr. Edgar Allen and Dr. Robert Osgood (America), Dr. Calvé (France), Dr. Murk Jansen (Holland), Prof. Putti (Italy), Dr. Rummelhoff (Norway), and Dr. Biesalski (Germany). The policy of the journal will be towards promoting unity of effort in bodies already dealing with one field of social work or another in connexion with the interests of cripples, and it is intended to provide information regarding all work in other countries bearing on this policy, and to print articles with the special object of instructing voluntary workers in clinical and training centres. Much stress will be laid upon the publishing of articles of an educational nature while, if the financial future of the journal allows, the price will remain at its present modest figure. We wish our contemporary all prosperity in its ambitious departure.

New Inventions.

PROBE-POINTED SCISSORS

FOR USE IN REMOVAL OF SALIVARY CALCULI.

IN removing calculi impacted in Wharton's duct, I have found the probe-pointed scissors here illustrated extremely useful. The probe is introduced into the duct as far as the stone, the scissors then lay open the duct, when the stone is usually extracted without difficulty.



The instrument has been made for me by the Genito-Urinary Manufacturing Co., 28A, Devonshire-street, W.1.

Birmingham. HAMILTON BAILEY, F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, AUGUST 4, 1928.

EPIDEMIC CONSTITUTION.

FREIHERR VON PIRQUET'S discovery of the skin reaction to tuberculin not only enabled us to realise the universality of tuberculous infection, but has also proved to be the forerunner of a series of investigations of a similar character which have brought within the compass of one scientific theory most of the epidemiological phenomena exhibited by a large group of the acute communicable diseases. The Schick and Dick tests, although the significance of a positive result is different from that in Pirquet's reaction, have been equally fruitful in the genesis of ideas as to the prevalence of the infections of scarlatina and diphtheria, and these ideas have been found applicable to the epidemiological problems of other droplet-borne infections, such as poliomyelitis, meningococcal meningitis, and epidemic encephalitis. Prof. ULRICH FRIEDEMANN'S paper, published on page 211 of our present issue, is an admirable survey of the present state of knowledge in relation to the ætiology of some of these diseases and the extent of latent infection with the virus, whether known or still undetected, of some of these diseases among civilised communities. The essential truth now established is the extent to which the population is constantly immunised, presumably by subminimal doses of the virus, against diphtheria and scarlet fever, a process which Prof. FRIEDEMANN terms "latent epidemisation." The meaning of this phrase has been tersely explained by W. L. AYCOCK[1] in these words, "Of susceptible individuals exposed to measles 1 out of 1 develops the disease; to diphtheria 1 out of 10 develops the disease and 9 out of 10 develop subclinical immunity; to poliomyelitis 1 out of 100 develops the disease and 99 out of 100 develop subclinical immunity, or immunity from abortive attacks." Students of epidemiology will subscribe generally to this view without committing themselves to acceptance of the numerical proportions, and there can be no doubt that the way to this state of agreement has been paved by the American workers on the dermal reaction to diphtheritic and scarlatinal toxins. At the same time, it is only right to remember that ideas of this nature, nebulous perhaps, like many ideas born of clinical observation, found expression long before they were capable of experimental verification, in explanation, for instance, of such facts as the observed immunity of fever hospital residents and nurses without the affliction of previous manifest disease, a peculiarity in relation to scarlet fever and diphtheria contrasting markedly with the behaviour of unvaccinated members of the staff in contact with small-pox. Indeed, it may be said that clinical observations, field inquiries, and statistical surveys had already made the minds of epidemiologists receptive to the idea of "latent epidemisation" and "latent immunisation," although the theory had not actually been given its present acceptance and wide application.

Since FARR made a science of vital statistics English epidemiologists have continued to search for the laws of epidemics, and many of the proceedings of the Epidemiological Society, which is now merged in the Royal Society of Medicine, will repay study to-day. The periodicity of the different zymotics, their incubation periods, age-incidence, and variable case-mortality in relation to the apparent source of infection, the course and peculiarity of single epidemics, the predictability of their behaviour, were all explored for the clue which would lead to the discovery of one thing common to them all, the law which governed their coming and going. FARR brought the art of epidemic prophecy to a high state of accuracy, and satisfied himself by purely mathematical reasoning that there was more behind the decline of an epidemic than mere exhaustion of the number of susceptibles existing at its onset. In more recent years attempts have been made to account for the decline and recurrence of epidemics by variation of the infectivity of the virus, a theory not inherently improbable since changes in virulence are well recognised. Perhaps the most ingenious mathematical attempt to correlate the seasonal and other variations of the incidence of epidemic disease was the application of the periodogram to this type of problem by BROWNLEE.

Working alongside the statisticians—sometimes combining more than one function in a single person—were the bacteriologists and the practical sanitarians, both piling up observations which undermined the old conception of the epidemic without supplying enough material to provide entirely new foundations. The bacteriologist established the existence of chronic or intermittent carriers of infection; the practical investigator of epidemics was more impressed with the importance of mild, anomalous cases of disease. But it was really the field observations of J. A. GLOVER and S. F. DUDLEY, followed by the laboratory study of epidemics in mice by W. W. C. TOPLEY, which established the paramount importance of the population-medium—its constitution, its spacing, its internal movement, and the influx of new members—as controlling factors in the rise and fall of epidemics. Flagrant disease, anomalous disease, *infection without* disease, intermittent and chronic carrier states are now seen in their true importance and interrelation with one another, and the reactions of Schick and Dick are measures of their combined influence. Many things still remain to be explained, notably the tendency for diseases practically to disappear and then revive with apparent irregularity and with impressive suddenness, like influenza and poliomyelitis, in the absence of abnormal migration, or to occur apparently de novo as in the case of epidemic encephalitis. But we have a solid addition to the body of medical thought in this new theory of the epidemic, which justifies the best part of the established measures for control of the communicable diseases, while revealing the reasons why these in themselves have proved insufficient to abolish the endemic zymotics from civilised communities. The criteria of communicability, too, have been extended, and we can no longer assume that diseases like rheumatism are non-communicable merely because case-to-case associations are untraceable. Further, we have been armed with a new specific preventive in the form of toxin or toxin-antitoxin inoculation, the value and limitations of which are well stated in Prof. FRIEDEMANN'S paper.

THE VACCINATION REPORT.

EARLY this week appeared the Report of the Committee on Vaccination appointed two and a half years ago by the Minister of Health in conjunction with the Medical Research Council. It was a Committee of seven with Sir Humphry Rolleston as chairman,

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[1] Amer. Jour. of Hygiene, January, 1928, p. 35.

Dr. J. R. Hutchinson as secretary, and Dr. F. R. Blaxall, Dr. G. F. Buchan, Dr. A. E. Cope, Dr. Mervyn Gordon, Prof. J. C. G. Ledingham, and Dr. J. R. Perdrau as members. The Committee was asked to inquire and report: (1) on matters relating to the preparation, testing, and standardisation of vaccine lymph; (2) on the practical methods which are available in the light of modern knowledge to diminish or remove any risks which may result from vaccination; and (3) on the methods of vaccination which are most appropriate to give protection against risk of small-pox infection in epidemic and non-epidemic periods. The Committee was at the same time given liberty to coördinate the work of investigation on these questions in this country and abroad. The Report is divided into two parts, of which the first deals with each reference in turn, and the second exclusively with the consideration of the nervous conditions which occasionally follow vaccination. A series of appendices complete a volume[1] of 324 pages, which is admirable alike in its lucidity and restraint.

The Committee's reference has given rise to an account of the methods of lymph production in general and especially those employed by the Government Lymph Establishment. The preparation of the vaccine is of peculiar interest, for, with the exception of the original Pasteur method of treatment of hydrophobia, small-pox vaccination is to-day the sole established instance of the use of a living virus as an immunising agent. Although strains of vaccine lymph of diverse origin are used, the vaccination process throughout the world is remarkably constant in character and uniform in feature, and agreement has been reached as to the methods of testing the potency of lymph and as to the minimum standard of potency which can be sanctioned. These tests and standards are now laid down in the Regulations under the Therapeutic Substances Act, and they give, in the Committee's opinion, the desired assurance that the preparation of vaccine lymph is being carried out on approved lines as regards minimal potency and comparative absence of associated micro-organisms. Government lymph, it is interesting to note, is not issued until about two years from the date of its collection, when, owing to the combined action of the glycerine and oil of cloves the extraneous organisms it contains are eliminated or reduced to 5 or less per mg. There is still, unfortunately, a great lack of information as to the minimal dose of lymph necessary to secure adequate immunity from small-pox, and this is a problem awaiting solution by experimental means. Singular promise lies in an observation recently made at the Lister Institute, where vaccine virus, in contact with chick embryo cells, has been found to increase in potency one-thousand fold. Otherwise there is a general consensus that different strains have similar immunising powers. Vaccination in this country has hitherto aimed at securing in infancy the longest possible duration of immunity and at postponing the time when revaccination should become necessary, whereas the American and Canadian practice is to popularise vaccination by rendering it as little incommoding as possible, with the hope that a second or even a third vaccination will not merely be tolerated, but even sought. The Committee now definitely recommends that, in place of the officially advocated four insertions, a trial should be made of vaccination and revaccination in one insertion with a minimum of trauma, and deprecates multiple scarification or cross-hatching. The optional age for vaccination on these lines is regarded as 2–6 months, and the offer of revaccination might with advantage be made when the child enters school at 5–7 years, and again on leaving it at 14–16 years. Multiple insertion would still be available for such persons as desire to obtain the maximum protection at one stage. Vaccinators are advised to inspect twice after vaccination, the second time between the fourteenth and seventeenth days, and to make it clear to parents that such medical attention as is required is obtainable without cost. The syllabus of instruction to medical students should, the Committee feels, be revised in the light of present-day knowledge.

The risks of vaccination have markedly diminished since the Act of 1898 came into force, and in so far as the risk is from sepsis it is likely to diminish further to a vanishing point. But the second part of the Report is, as we have said, given up entirely to the risk from disease of the central nervous system following vaccination, and there might appear to be a certain want of proportion in devoting more than 100 pages to this subject, were it not for the fact that the occurrence of post-vaccinal nervous disease, however seldom of occurrence, cannot fail to have a bad effect on vaccination both in its administrative and in its medical aspects. Happily the Committee is able to point out the extreme rarity of such manifestations. During a period of five years (1922–27), in which 3 million charges of lymph were issued by the Government station, and the estimated number of vaccinations performed in this country was over 4½ million, 51 deaths were recorded from this cause. Particularly rare is nervous complication after revaccination and after primary vaccination in early infancy, and on this ground, if on no other, early infancy remains the time of choice for primary vaccination. Here is incorporated, at length, the report of the committee appointed in 1923, under the chairmanship of Sir Frederick Andrewes, which now sees the light in this country for the first time. Although the non-appearance of the Andrewes Report may have occasioned undue anxiety in some quarters, justification of the delay lies in the reassuring commentary which now appears in the light of further knowledge. The Rolleston Committee unanimously acquits vaccinia virus of being the sole cause of nervous sequelæ, although it cannot exonerate vaccination from playing some part in their causation. It is its considered opinion that the coöperation of vaccinia with the viruses of poliomyelitis or of encephalitis lethargica, or possibly some unknown neurotropic virus harboured by a vaccinee, must for the present be retained as a working hypothesis of causation. It is hoped that the publicity now given to this complication will result in an accumulation of clinical and epidemiological data which may help along with experimental research to solve a problem of great importance in quality if not in quantity.

The final recommendation is to the effect that steps be taken to impress upon the public mind the nature and purpose of vaccination. The Committee's Report will afford the medical profession for the first time a body of accurate and unbiased information to be used for this purpose, and we believe with good prospect of success.

ANTHROPOLOGY AND PARASITES.

THE nasty grey squirrel which came from North America and escaped from the Zoo some years since to spread all over England, as far north as Yorkshire, and at least to the Cotswolds in the west, carries with it everywhere its own special flea; anyone knowledgeable in such matters (whether he should be called a pulicophile or a siphonapterologist we do not know) who picked up a dead *Ceratophyllus wickhami* in the road would be sure that *Sciurus cinereus* was not far off. And this is the general truth about parasites; each species is adscript to one or at most two or three hosts, and very few are so little particular in their habitats that they range indifferently over a large number. When the hosts travel they take their parasites with them. It is very unlikely, for instance, that the great plague vector *Xenopsylla cheopis* is autocthonous in England; it lives, or used to live, on the rats in the Borough because it had come with its host from the tropics. Similarly, the provenance of the labourers on the coffee plantations in Brazil can be predicted by finding out whether their predominant hookworm is *Ankylostoma duodenale* or *Necator americanus*. This segregation and isolation of parasites in particular hosts naturally encourages speciation—i.e., separation into distinguishable forms—and their occurrence may give us some information both as to where the host has been quite lately and as to where and what the hosts' ancestors have been in the remote past. The specific differentiation of human lice as they occur now is dubious and uncertain; it is supposed that they are largely mixed hybrids of some definite species which used to occur isolated on the primary human races, and which have become mixed by human migrations and intercourse.

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[1] Ministry of Health. Report of the Committee on Vaccination. Cmd. 3148. H.M. Stationery Office. 1928. 7s.

In one way and another, therefore, parasites may throw light on a good many general questions, and in the last number of the *Quarterly Review of Biology* (vol. iii., p. 225) the possible evolutionary significance of the protozoan parasites of monkeys and man is discussed in an interesting way by Prof. ROBERT HEGNER, of the Johns Hopkins School of Hygiene. He recognises six amœbæ, seven flagellates, one coccidium, and one ciliate as being genuinely parasitic in the human intestine, of which *Entamœba histolytica*, *Isospora hominis*, and *Balantidium coli* are definitely pathogenic: in the blood we have three malarial parasites, three trypanosomes, and three *Leishmania*. The protozoa of monkeys are naturally not nearly so well known, and it is obvious that observations on animals living in captivity in close association with man are not of much significance. The monkey amœba *E. nuttali* is as like the human *histolytica* as it can be, nor can their harmless *E. coli* be distinguished from those found in man. And with the exception of the *Leishmania* the same correspondence is found in the other groups; 11 out of 15 of the human genera, and two-thirds of the human species have been described from monkeys, though the malarial parasites of monkeys would be better described as very similar to, rather than identical with, that of man. The facts are interesting; their interpretation is difficult, for such a situation may have arisen because man has a genetic relationship with monkeys or because he provides in his bowels, his blood, and his economy in general, a similar series of habitats. On either hypothesis human parasites would be more like those of monkeys than those of rats or cows, and there seems to be nothing in the argument which would convince a determined fundamentalist of error. On the whole, the genetic relationships of hosts and parasites are not very close, and if the occurrence of monkey parasites in man indicates the line of human descent, what significance are we to attach to the discovery of *Balantidium coli* in pigs and guinea-pigs or to the fact that the other natural host of *Pulex irritans* is the badger?

Annotations.

"Ne quid nimis."

THE BUNDABERG REPORT: FATAL STAPHYLOCOCCAL INFECTION.

THE report of the Royal Commission on the Queensland serum tragedy of last January[1] has now been tabled in the Federal Parliament. The findings of the Commission are these:—

The Findings.—1. The injections of toxin-antitoxin mixture administered by Dr. Thomson at Bundaberg on Jan. 27th, 1928, were responsible for the deaths of 12 out of 21 children inoculated, and for the illness of several who survived.

2. The toxin-antitoxin mixture as issued by the Commonwealth serum laboratories was properly prepared and sterile, but contained no antiseptic, and, therefore, did not prevent the growth of micro-organisms accidentally introduced into it.

3. The rubber-capped bottle of toxin-antitoxin supplied to Dr. Thomson at Bundaberg was accompanied by no information as to the presence or absence of antiseptic.

4. The omission of antiseptic was intended to safeguard against the dangers attendant upon freezing, but the issue of this preparation without antiseptic in rubber-capped bottles suitable for repeated usage is an unsound procedure.

5. The toxin-antitoxin mixture in the bottle used by Dr. Thomson was contaminated by him with a pathogenic staphylococcus during a series of inoculations on Jan. 17th, 20th, 21st, and 24th, most probably on the last occasion.

6. The consideration of all the available evidence concerning the deaths at Bundaberg points to the injection of living staphylococci as the cause of the fatalities.

As a result of much experimental work and a critical review of the evidence, the Commission was led to make certain definite recommendations with a view to avoidance of similar tragedies in the future.

The Recommendations.—1. That biological products in which the growth of pathogenic organisms is possible should not be issued in rubber-capped containers for repeated use unless there is present in the material a sufficient concentration of antiseptic to inhibit bacterial growth.

2. That all biological products not containing antiseptic, however issued, should bear a conspicuous printed notice, both on the container and on the package, to the effect that no antiseptic is present; that they should be used immediately on opening, and any remaining product discarded.

3. That biological products should be distributed in bottles or ampoules of clear glass in which it is easier for the medical practitioner himself to detect turbidity or any other defect.

4. That the Commonwealth Department of Health should make full and careful inquiry as to whether it be advisable to substitute anatoxin or some similarly modified immunising agent for toxin-antitoxin.

5. To ensure the adoption of the most approved technique, facilities for special post-graduate training should be afforded to all medical officers entrusted with the conduct of public campaigns to diminish the incidence of disease by immunisation.

Poisoning by diphtheria toxin, it will be noted, is excluded on adequate grounds. The clinical picture in the fatal cases was not that of fatal diphtheritic toxæmia: at the autopsy the suprarenal glands were found to be normal, and the children who recovered did not show any of the characteristic sequelæ of diphtheria. No free toxin was found in the prophylactic remaining in the fatal bottle nor in many duplicate bottles taken from the batch of prophylactic incriminated. The possibility of tetanus was carefully considered and rejected. The evidence for staphylococcal infection was that the remaining fluid in the bottle used was noted as cloudy on the day after the injections, that the contamination had "almost certainly" occurred three days before the fatal injections were given, and that the remaining fluid in the bottle yielded a pure culture of staphylococcus. Of the 21 children injected 12 died; in all 9 survivors, of whom 6 were ill, abscesses developed at the site of injection, and from 5 of these abscesses a staphylococcus apparently identical with that in the fatal bottle was recovered in pure culture. The estimate is that five million cocci, together with their products of growth, were injected into the children. The children began to suffer within six to eight hours from vomiting, diarrhœa, fever, early unconsciousness, retention of urine, and, in the younger ones, convulsions, death occurring within 24 hours in several instances. With two doubtful exceptions no metastatic staphylococcal abscesses developed in any of the survivors. The coccus isolated did not seem to possess any unusual cultural or fermentative properties and closely resembled varieties of *Staphylococcus aureus*, though it produced "a buff coloured" and not "a typically orange" deposit. An antiserum to the coccus agglutinated aureus strains typically. Apparently neither culture nor filtrate produced in laboratory animals, including *Macacus rhesus*, a picture resembling that seen in the children, though small doses given intravenously to rabbits killed in 12 to 24 hours with convulsions. Evidently higher monkeys were not available for injection. The Commissioners very fairly state that their findings are based on evidence that is suggestive rather than conclusive, that unfortunately defects in the clinical study of the cases and lack of specialised bacteriological and pathological examination of the children who died left serious gaps in the evidence, and that "short of the unthinkable experiment of injecting the living staphylococci into children, it is not possible to offer rigid proof . . . for there is not within our knowledge any previous experience of the subcutaneous injection of large numbers of living staphylococci into young children." Bacteriologists, we think, will agree that the Commission could not do otherwise than conclude that the contaminating staphylococcus and its toxins caused the deaths, and that the tragedy would have been avoided had the prophylactic contained sufficient antiseptic, a practice which is probably universal in England, America, and the Continent. So far as we can find, there are on the English market no prophylactic preparations without adequate antiseptic. On such points the Therapeutic Substances Act provides for any control considered necessary.

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[1] THE LANCET, 1928, i., 249, 1293.

Two other points in the report merit attention. The Commission recommend inquiry directed towards the replacement of toxin-antitoxin mixtures by toxoid or anatoxin. No reasons for this recommendation are given in the text of the report available at the time of writing. The needles used in immunising the children had apparently been kept in methylated spirit. The phrase "sterilised in methylated spirit" occurs in the report. It is well known, and has been emphasised by T. J. Mackie[2] in a recent important review of the preparation of catgut, that methylated spirit possesses a restricted bactericidal power and that it cannot be relied upon to sterilise surgical apparatus if resistant or spore-bearing microbes are in question.

THE TRAFFIC IN NARCOTIC DRUGS.

In accordance with a precedent initiated last year, the annual report of the British Government to the League of Nations (1927) on the traffic in opium and other dangerous drugs, has been communicated to the press. It deals with the administration of the Dangerous Drugs Acts, 1920 and 1923, in Great Britain, and furnishes abundant statistical information as to the manufacture in this country of morphine and heroin and their salts, and as to the import and export of opium and its alkaloids, and of cocaine during 1927. Reference is made to the extent of the international illicit traffic alluded to in THE LANCET of July 21st (p. 133). While several seizures of drugs were made at English ports on ships of British nationality, it is satisfactory to learn that no information had been received that any firm in Great Britain had been engaged in smuggling drugs abroad, nor have any seizures of drugs of British manufacture been reported during the year. It may be well worthy of consideration whether, if all members of the League of Nations and States parties to The Hague Opium Convention of 1912 had passed—and enforced—legislation like the Dangerous Drugs Act, 1920 and 1923, which gave effect to that Convention, the international situation in regard to the commerce in narcotic drugs would not be more satisfactory than it is. The amount of British morphine manufactured and exported continues to fall. While a few years ago some 14 tons were in one year exported, in 1927 the amount was 66,107 oz. The figures for heroin are less satisfactory, 17,427 oz. having been manufactured against 11,113 oz. in 1926; 11,165 oz. were exported against 6799 oz. in 1926; 4673 oz. were consigned to France, a considerable increase on the amount for 1926. Of 107,042 lb. of raw opium arriving through the approved ports of London, Liverpool, and Southampton, no less than 86,080 lb. came from India, and only 19,888 lb. from Turkey. As the morphine content of the Indian drug was 10·98 per cent., against 11·12 per cent. in the Turkish, the old prejudice against the pharmaceutical use of the Indian variety, by reason of its alleged poverty in the alkaloid, appears to have been ill-founded. Hitherto there has been no production of cocaine from the leaves, or by refining crude cocaine, in Great Britain, but in 1927 a licence was granted to Messrs. May and Baker, Ltd., of Wandsworth, to carry on experiments in such manufacture. The licence precludes the marketing of such produce without the special sanction of the Home Office.

Two important seizures of cocaine have been made in London this year, one of Japanese manufacture smuggled in by a Lascar on a vessel from the Far East; the other of German manufacture exported to Lithuania and thence smuggled in by a Lithuanian resident in London. There were 60 prosecutions under the Dangerous Drugs Act in 1927; 45 persons were convicted and fined, or imprisoned, or dealt with under the Probation of Offenders Act, while five were recommended for deportation. It appears that a considerable amount of morphine (65,746 oz.) was used in 1927 for the manufacture of codeine. This alkaloid is not scheduled as a dangerous drug, although in the first draft of The Hague Convention it was included. The question of applying to it the provisions relating to morphine and heroin has engaged the attention of the Opium Advisory Committee at Geneva.

ACUTE EMPYEMA.

In a recent article on the treatment of acute empyema, Dr. Antoine Basset maintains[1] that there is no longer any uniformity of method in dealing with this condition, nor is there any soundly established doctrine to guide the practitioner when faced with this emergency. Prior to the epidemic of influenza in 1918, the treatment of empyema was similar to that of any other collection of pus—viz., immediate evacuation and drainage. To render these more effective, costal resection was usually practised. The customary method was adopted for the treatment of empyema complicating broncho-pneumonia during the earlier months of the pandemic, but the results were profoundly disappointing. In certain of the American military camps the post-operative mortality is said to have reached the figure of 84 per cent. As a consequence less drastic methods were advocated: aspiration with irrigation of Dakin's or Murphy's solution replaced the classical operation of costal resection and open drainage. The advantages to be derived from conservative treatment, at least as a temporary measure, were discussed at the Twenty-third Congress of the French Surgical Association in 1920, and the matter has been debated ever since. Dr. Basset advises postponement of operation when empyema complicates acute pulmonary disease; in such cases he considers it advisable to wait until the pneumonic process shows signs of retrogression. Meanwhile the patient may be relieved by aspiration of pus and supported by medical treatment, including vaccine and serum therapy. When operation is decided on, a local anæsthetic should be used and as a rule the most effective drainage will be secured by resecting 4 or 5 cm. of the tenth rib in the posterior axillary line. Pneumococcal empyema in children is often a relatively benign infection, and for these cases repeated aspirations may suffice. They are certainly to be preferred during the acute pneumonic stage. Rib resection should also be avoided in early childhood—i.e., before the age of 18 months. But there is an exception to the statement that in the presence of an acutely diseased lung preliminary treatment by aspiration is the method of choice. A putrid empyema, or one associated with gangrene, should be freely drained at the earliest possible moment whatever the condition of the subjacent lung. Dr. Basset lays stress on the importance of a careful cleaning of the empyema cavity by gauze swabs at the time of operation. Neglect of this precaution may lead to blocked tubes and ineffective drainage. Short wide tubes should be used and the employment of a Tiegel's valve will permit free exit of pus while preventing the entrance of air during inspiration. A simpler method of attaining the same end is, of course, to connect the drainage-tube with a reservoir containing antiseptic solution.

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[2] An Inquiry into Post-Operative Tetanus. A Report to the Scottish Board of Health. See THE LANCET, 1928, i., 1187.

[1] Traitement des pleurésies purulentes aiguës de la grande cavité, Arch. med.-chir. de l'appareil resp., December, 1927.

INTESTINAL BACTERIA IN PERNICIOUS ANÆMIA.

IT is rather more than 20 years since Dr. C. H. Herter pointed out that *Bacillus welchii* was abnormally abundant in the fæces of cases of pernicious anæmia, and rather before that time Dr. William Hunter began to urge the ætiological importance of gastric and intestinal streptococci. Both organisms are hæmolytic in the sense that they can produce extracellular toxins which are capable of dissolving red corpuscles both in vitro and in the body of experimental animals. The capacity of *B. welchii* in this respect is especially powerful, and Dr. H. G. M. Henry and others have worked out the conditions under which its hæmotoxin is produced, how it acts in the body, and how it stimulates the production of an antitoxin. That the chronic anæmia of pernicious anæmia is directly due to any such antigenic hæmolysin is on general grounds very unlikely; the body would become actively immune, and if it did not it should be easy enough to make it passively immune by injecting *welchii* antitoxin; this has no effect on the course of the disease. But if *B. welchii* and streptococci do not cause the disease directly by their hæmolysins, it does not follow that they play no rôle in its pathogenesis. The absence of acid from the stomach is a grave abnormality and is obviously likely to upset the bacteriology of the alimentary tract, at any rate in its upper part. An abnormal abundance of organisms has been described by a number of observers, and the whole subject is reviewed in a comprehensive way in the current number of the *Journal of Pathology and Bacteriology*, by Dr. Stanley Davidson, of Edinburgh, who has elaborately studied 41 cases of pernicious anæmia along with normal controls and examples of other diseases, examining the fæces and the gastric and duodenal contents; these two last cannot, he says, be separated, since the patulous pylorus of pernicious anæmia leaves the stomach and duodenum in free communication. His results are, briefly, that in pernicious anæmia there is a great numerical increase in *B. coli*, streptococci, and *B. welchii*, both in the stomach and in the stools. These microbes are normal inhabitants of the human alimentary tract, and a careful investigation of their varieties failed to show any qualitative difference between those found in healthy persons and those from pernicious anæmia. He concludes that there is no evidence that any individual type of organism is specifically related to pernicious anæmia. At the same time, he attributes great ætiological importance to the quantitative increase of bacteria, especially at levels in the small intestine which in normal persons are relatively free from bacteria. It may be supposed that these act by producing, directly or indirectly, substances which, passing by the portal circulation, impede the action of the liver. The gastro-duodenal sepsis runs parallel with the achlorhydria, and both continue unaltered after cure by liver. On this view pernicious anæmia is a pathological but not an ætiological entity. The changes described in the flora of the alimentary tract are not quite invariably present, and other factors may less commonly play an important part. Dr. Davidson mentions a hereditary or constitutional element in the disease, but the evidence for this is rather nebulous.

MEDICAL HISTORY STATEMENTS.

A RECENT paragraph in the *Solicitors Journal* draws attention to some observations of the county court judge at Birmingham upon the practice of medical witnesses. In workmen's compensation and other cases it is often necessary that the medical practitioner should ascertain the patient's medical history before diagnosis. But the statement which the patient gives may be closely connected with the very facts which are in dispute. In the Birmingham case apparently the plaintiff's representative suggested that the medical witness had exceeded his professional duties in obtaining such a statement. On the other hand, on behalf of the defendant it was stated that the statement was obtained by the medical witness in the presence of the patient's own doctor and was written down in the presence of both. His honour Judge Ruegg, K.C., observed that nothing unusual had been done, but that it was becoming a habit with doctors to take particulars of this kind, and then to come into court and give evidence of the contents of the statement. Upon this position two comments seem proper. In the first place it is always the duty of a medical witness to distinguish between facts which are within his own direct knowledge and matters of which he has merely been told. This distinction is notoriously of great significance in the process of certifying a patient under the Lunacy Act. The second comment is that which the county court judge himself made. He thought it objectionable that doctors should obtain statements in the way mentioned, because, if a patient knew that statements were to be obtained in that way, he would hesitate to go to a doctor. Subject to these two comments it is clear that a medical witness's evidence may be useless, unless he has been made aware of the patient's medical history, and the witness is entitled to state how far the patient's condition is consistent with, or could be explained by, that history. It does not appear that an experienced county court judge could ever be misled by medical evidence properly so obtained and tendered.

SCHOOL MEDICAL OFFICERS AND THE NOTIFICATION OF MENTAL DEFECT.

THE passing of the Mental Deficiency Act, 1927, has made it necessary for the Board of Education to revise their regulations governing the notification of children and the draft of the new regulations has recently been published. These will come into force on Oct. 1st, 1928. They are decidedly shorter and simpler than the old ones, and in addition to containing certain minor alterations consequent on the changes in the Act, they make an alteration which should be welcome to local education authorities and their medical officers. The Act requires, in the case of defective children of 7 years and upwards; who are incapable by reason of mental defect of receiving benefit or further benefit in special schools or classes, or who cannot be instructed in a special school or class without detriment to the interests of the other children, that their names and addresses shall be notified by the local education authority to the local mental deficiency authority, who will then be responsible for them. Under the old regulations, if the child whom it was proposed to notify was not an idiot, imbecile, or moral imbecile, the Board of Education required that their sanction should be obtained before such notification was made. Under the new regulation this has been waived, and cases in future can be notified on the certificate of the school medical officer without reference to the Board. There is a provision that in the case of the local education authority being in doubt regarding any child so certified, they may refer the matter to the Board before discharging their statutory duty of notification, and such reference to the Board is compulsory in the case of blind or deaf children coming under Section 69 of the Education Act, 1921. It may happen that a child is certified by the medical officer as not being incapable of receiving benefit from instruction in a special class or school, but is nevertheless considered to be in need of supervision, guardianship, or institutional care. In this event the case is to be referred to the Board, and if the Board certify that there are special circumstances which render it desirable for the child to be dealt with in this way, it then becomes the duty of the local education authority to notify the case to the local mental deficiency authority. In the case of children about to be discharged from special schools on or before attaining the age of 16 years, the local education authority may still, as previously, decide as to whether notification should be made without reference to the Board. We think that the alterations which have been made will tend to simplify administration, and they are doubtless inspired by an increased confidence on the part of the Board in the efficiency of school medical officers and local education authorities.

PHARMACY AND BIOCHEMICAL DISCOVERY.

ADDRESSING the British Pharmaceutical Conference at Cheltenham on July 24th, the chairman, Mr. R. R. Bennett, B.Sc., F.I.C., selected certain aspects of biochemistry of importance to those engaged in the practice of pharmacy, dealing in succession with the practical applications of the study of hormones and vitamins. More than ever before the pharmacist, he said, is dealing with remedies which can only be assayed and standardised by biological methods, a fact which was bringing into prominence the increasing work carried out at the Pharmaceutical Society's pharmacological laboratories. The General Medical Council had been criticised for its failure to introduce biological methods of standardisation into the current British Pharmacopœia, but, said Mr. Bennett, the Council should not be blamed for that; at the date of its issue the Council could not have prescribed biological tests as there were no official standards for such tests, nor had the Council then any power to enforce such standards in the absence of a laboratory where tests could be made. It was only the coming into force in August, 1927, of the Therapeutic Substances Act of 1925 which had brought into being a Joint Committee charged with the duty of prescribing standards, tests, and units of standardisation for therapeutic substances, the purity and potency of which could not be adequately tested by chemical means. Standards had now been defined for a number of such substances, laboratories had been appointed to prepare and keep the standards, and machinery for controlling their application had been created. The Pharmacopœia Commission which would soon come into existence would, he said, accordingly be able to include in the next edition of the Pharmacopœia any therapeutic substance for which a standard of reference had been defined by the Joint Committee, and to introduce a biological method for standardising any substance for which a standard had been set up. Mr. Bennett congratulated the Pharmaceutical Society on its readiness to adapt itself to these fundamental changes, and concluded with the remark that the future of pharmacy will depend upon the continued cultivation of the scientific habit of mind and upon the power of confronting new conditions and new difficulties with systematic knowledge and perfected technique.

ETHYL PETROL.

THE internal combustion engine has its marked likes and dislikes, and, last autumn, the first consignment reached this country of a kind of fuel which had been found in America to abolish a tiresome form of engine trouble; but this ethyl gasoline, as it was called, contained a small proportion of lead tetra-ethyl in the manufacture of which distressing cases of lead poisoning were known to have occurred. The question arose whether the consumer might not also run some risk from its use, and a discussion in the House of Lords last February elicited the statements that Sir William Pope regarded lead tetra-ethyl as a poison likely to be absorbed through skin abrasions and by the lungs, and that Prof. H. B. Baker believed it might reach the body through the unabraded skin. As a result of this discussion the Minister of Health agreed to appoint a Departmental Committee to inquire into the possible dangers to health resulting from the use of motor spirit of this kind. This Committee,[1] which included distinguished chemists, toxicologists, and medical administrators, has now issued an interim report,[2] the message of which may be stated at once to be: "there is no evidence to show that the use of ethyl petrol as a motor fuel involves more dangers to health than the use of ordinary petrol." This favourable report was not unexpected in view of such evidence as is presented in the report[3] by Dr. Alice Hamilton, of Boston, to the International Labour Office. From this report it was already clear that scrupulous care has practically eliminated risk from the manufacture of tetra-ethyl lead and also from the process of blending it with petrol. Moreover, the workers so employed can be carefully supervised and fully protected. In regard to the chauffeur and the garage man who fills petrol into cars, a committee of experts issued in 1926 a considered report based on experimental work. No definite signs of lead absorption were detected after exposures of two years, and no good grounds were found for prohibiting the use of ethyl petrol as a motor fuel, provided that its distribution and use were controlled by regulations. Evidence, however, was forthcoming that, quite apart from the use of lead in petrol, lead dust does accumulate wherever motors are garaged, and that whether it originates from paint, from rubber, or from accumulators the risk of poisoning seems comparable to that which might arise from ethyl petrol. The risk from lead, however, is regarded as definitely less than that from carbon monoxide, which nowadays necessitates free ventilation of garages and motor-sheds.

The Departmental Committee's report brings Dr. Hamilton's monograph up to date and contains the evidence of Dr. J. P. Leake, of the United States Public Health Service, who assured the Committee that although careful search had been made for possible injury to health from the use of ethyl petrol, no instance of injury had come to light. It is true that there is no compulsory notification of industrial lead poisoning in the U.S.A., but Dr. Leake's inquiry extended over private sources, press-cutting bureaux, and the health authorities of each separate State, and in view of the publicity which has been drawn to this fuel it is hardly likely that any cases of poisoning should have escaped notice. In regard to the risk of inhaling lead from ethyl petrol, Sir Robert Robertson was able to assure the Committee that the first half of petrol evaporated from the mixture is entirely free from lead tetra-ethyl. The risk to health from spillage, although unproved, is regarded as a possibility not to be ruled out, and is to be the subject of further experiment. Absorption through the skin may not be as important as was supposed, for it has been shown that a monkey may be anointed 760 times with ethyl petrol, at intervals of about a day, without more than the merest trace of lead being found in its tissues after death. The Committee has been especially impressed by the reassuring fact that garage workers in the U.S.A. who have been handling ethyl petrol continuously for four to five years show no signs of lead poisoning. Although satisfied on this point the Committee emphasises the warning that ethyl petrol should be used only as a motor fuel and not for such purposes as cooking or cleaning. Sales in this country are, in fact, governed by regulations which require the dyeing of the substance red as an additional check against its use otherwise than as motor fuel, the labelling of cans and pumps, and the issue of notices to the public. The Departmental Committee has thus reported definitely on the main point at issue, although, as has been said, further investigations are to be made on certain points. In the meantime, the city of New York has just rescinded its prohibition on the sale of ethyl petrol within its borders.

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THE M.A.B. ANNUAL REPORT.

THE Metropolitan Asylums Board has just published its annual report[1] for the year 1927–28, being the thirtieth year of issue. It is the familiar orange paper-covered volume of 350 pages, containing first an account in 75 pages of the Board's multifarious activities intended for the enlightenment of the public, then a number of elaborate financial and other tables, and, thirdly, a series of monographs on one aspect or another of the clinical work done under the auspices of the Board. For those who have the ingenuity and patience to find their way about this report, it is a veritable mine of information. There may still be readers who need to be reminded of the enormous scope of the Board's activities, dealing as it does with the reception and care of various classes of sick and infirm from all the unions and parishes in London. The number of occupied beds in the various institutions of the Board on the last day of the year under review was 20,746, and the total accommodation includes 8444 beds for fevers (excluding 60 for ophthalmia neonatorum and 52 for venereal diseases), 2168 beds for tuberculosis, 2006 beds in children's institutions, 9387 beds in mental hospitals (not including 355 for sane epileptics), and, finally, 734 beds in the training ship *Exmouth*, and 828 beds in casualty wards for the poor. The total annual expenditure was round about £2,350,000, allotted to the four main groups—feeble-minded, fevers, tuberculosis, and children—in the proportions roughly of 63 : 96 : 26 : 25. During the year the fever accommodation has been revised and reallotted to conform with the standard laid down by the Minister of Health—viz., 1872 cubic feet, 144 square feet, and 12 linear feet per bed, without substantial diminution in the number of beds. In these hospitals a salutory change of policy resulted in the allocation of 1581 beds to measles at the beginning of April last. Although the daily average for diphtheria during the six winter months was as high as 2483, not many scarlet fever patients were displaced, owing to the use of the Joyce Green Hospital at Dartford as a safety-valve. The concentration of cases of puerperal fever in two of the infectious hospitals, one on either side of the river, has facilitated a research by Mr. J. M. Wyatt, the obstetric consultant, into the method of infection in puerperal women; in each case, when a patient is sent in, a swab is taken by the accoucheur from the throat of the nurse or midwife in attendance on the woman. At the Western Hospital a small number of beds has been allocated, as before, to cases of poliomyelitis in the acute stage, under the supervision of Mr. George Perkins. At the North-Western Hospital a clinic was opened last June for the treatment by radium of cancer of the uterus under the supervision of Mr. Comyns Berkeley; the allotment of eight beds will suffice for the full use of two sets of radium applicators. The experiment of assembling cases of encephalitis lethargica at the Northern Convalescent Hospital, Winchmore Hill, has been continued, admission of extra-metropolitan cases having been sanctioned in order fully to utilise the allotted beds. This experimental unit, as Dr. G. A. Borthwick frankly admits, has not been productive of curative results, although it has proved valuable as an observation station, and on this ground the Board has approved its continuance. Artificial sunlight treatment has now been installed at four hospitals, two on each side of the Thames. Long Reach Hospital being under reconstruction, in May last cases of small-pox overflowed from the temporary accommodation loaned by the Willesden U.D.C. at Kingsbury, into the large reserve hospital at Joyce Green. The type of small-pox case in London now approximates closely to that which has prevailed for several years in the northern counties. In the first half of the present year 172 cases were admitted from 17 different metropolitan boroughs. During the year 437 students (of whom 79 were women) attended courses of instruction at the Board's fever hospitals. At the mental hospitals a revised dietary came into force in June, admitting of the use of fresh fruit, when obtainable, on two days a week, while a canteen for the use of patients has been established at Darenth Training Colony. A difficult situation is arising from the steady increase in the number of young able-bodied men seeking admission to casualty wards, and the Board proposes to reinstate the breaking of stone by hand as a deterrent task. No more has here been attempted than a brief outline of the Board's activities; we shall have occasion to return to some of the clinical reports.

CONTRIBUTORS to the Ferrier Memorial Fund met on July 18th under the chairmanship of Sir Charles Sherrington, and resolved to invite the Royal Society to accept the sum of £1000 in trust to found a David Ferrier Memorial Lecture. The balance of the fund will be applied as seems most suitable when the total contributions are known. The Fund is to be closed on Sept. 30th.

EPSOM COLLEGE.—Founders' Day was observed at Epsom College on Saturday last, July 28th, when the celebration included service in chapel, distribution of prizes, and a garden party on the College playing-fields, where many parents and supporters of the College were spectators of a well fought-out cricket match between the College and the old boys. After service in chapel, and a luncheon-party at which the Council of the College acted as hosts, an adjournment was made to the big school-room to hear the headmaster's report, after which the prizes were distributed by Lord Riddell. The headmaster, Mr. Arnold Powell, was able to point to a year of successful work and successful play, the number of leaving certificates obtained being large, while the successes recorded in scholarship competitions and public examinations were numerous. Further, during the year the old Epsomians had, he said, given a good account of themselves, and this was indicated by tripos lists at Oxford, Cambridge, and London Universities, and by the pass-lists of various corporations and medical schools, the Law Society, and the Institute of Actuaries. Lord Riddell then distributed the prizes and delivered a short address in which he interested and amused the audience by a character sketch of Hippocrates, whom he held up for the imitation of youth as a fine example of independent thinking, high purpose, and power of mental concentration. During the afternoon the band of the 1st Battalion of the King's Own played appropriate selections, while in the evening a choral performance of *Iolanthe* was given by the College Musical Society. The organisation of the celebrations was excellent.

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[1] From the Office of the Board, Victoria Embankment, London, E.C. 5s. The medical portion of the volume is obtainable in four separate sections, price 1s. each.

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"*An Infernal Machine.*"

The fact that England may still play some part in Irish affairs was brought home to the meeting by Dr. J. C. LOUGHRIDGE and Dr. J. R. GILLESPIE, from whose speeches it appeared that Belfast Corporation, in the course of departmental reforms, had introduced a system of "clocking in and out." To this indignity even the medical officers were asked to submit, and one of them, rather than do so, had incontinently resigned. They felt very keenly about this in Ireland, and they invited the Representative Body to say that it objected to medical officers "being required to record the time of their arrival at, or departure from, duty on a recording machine, as it is derogatory to the dignity of the profession." There was all the difference between signing one's name in a book and using an infernal machine; the second method implied disbelief in one's honour. The B.M.A. had no more loyal adherents than in Northern Ireland (statistics of membership were here quoted), and "God help us," said Dr. Gillespie, "if we can't have the help of this mighty organisation."

They got it, the motion being carried with no dissentient voice.

Public Health and Poor-law.

Several resolutions introduced by Dr. E. LEWYS-LLOYD, Chairman of the Public Health Committee, were carried without much discussion. The first laid down that all tuberculosis officers whose clinical work in areas is not subject to detailed supervision by the chief tuberculosis officer should be entitled to a minimal commencing salary of £750 per annum. The second dealt with pathological reports, and ran as follows:—

> That the work of laboratories established by public health authorities should, in the opinion of the Representative Body, neither provide for pathological examinations nor furnish reports on individual cases, except (1) in cases which directly involve questions of public health, or (2) where provision is made for such reports by statutory right, or (3) when the patient is stated by the practitioner to be unable to pay a fee; provided that in parts of the country where facilities for pathological examinations and reports are not afforded either by private practitioners (pathologists) or by the service of the local hospital, the public health laboratory may properly make examinations and furnish reports as these are required by practitioners for patients who are in a position to pay the usual professional fees.

The meeting agreed that in areas where there are cases of small-pox, and where propaganda work in favour of vaccination is not carried out by the local authority, the local division should try to stimulate the authority to do this work or else do what it can to supply the deficiency.

Another resolution, described by one representative as the "anchor of the general practitioner's freedom," made clear the Association's policy that "domiciliary attendance should, in the best interests of the patients, be provided by private practitioners in the area concerned and not by a whole-time medical officer." This was not to prejudice the position of any medical officers at present holding whole-time appointments in which domiciliary attendance was one of the duties, nor would it, of course, apply in areas where no general practitioner was willing to undertake the work on suitable terms.

The question of the combination of the duties of medical officers, poor-law medical officers, and public vaccinators was discussed in the light of probable changes in poor-law administration. Dr. H. B. BRACKENBURY, Chairman of Council, explained that the combination of these offices was now approved by the Minister of Health, and Dr. MILBANK SMITH said that when the poor-law was abolished, it must be ensured that vaccination work was not transferred to the medical officer of health. The rights of the private practitioner must be safeguarded. The meeting agreed that there was no objection in principle to the combination in one and the same whole-time appointment of (*a*) the duties of a M.O.H. and those of a poor-law institutional medical officer, or (*b*) the duties of an M.O.H. or poor-law institutional officer and those of a public vaccinator. But the application of these principles in any individual instance "must be governed by local circumstances and by the opinion of the Division or Divisions concerned."

Spa Treatment of Panel Patients.

Dr. H. G. DAIN, Chairman of the Insurance Acts Committee, introduced a scheme drawn up by the British Spa Federation for the provision of treatment for insured persons at various British spas. He said that the approved societies were not yet in a position to provide this form of additional benefit, but they might be able to do so out of their "disposable surpluses" after the next valuation. Meanwhile the Federation wished to be ready, and their scheme need cause no anxiety to the private practitioner, since all it demanded from him was the filling-up of a simple form of recommendation.

Criticisms were nevertheless raised from various points of view. Dr. A. T. JONES, for North Glamorgan and Brecknock, wanted to know exactly what was the position of private practitioners in the towns to which the cases would be sent. What was the definition of the "spa physician" by whom the cases would be treated? He wanted an assurance that the care of these patients would not be the prerogative of a few.—Dr. H. M. RAVEN (Broadstairs) thought that the fee of a guinea given to the spa physician for three weeks' treatment, exclusive of radiographic and bacteriological investigations, compared favourably with the fee of "about a shilling" which seaside practitioners got for three months' temporary residence by an insured person in their area.—Dr. L. W. BATTEN suggested that the spa physician's privileges were better defined than his duties.

Dr. E. R. FOTHERGILL, who had helped to draw up the scheme, agreed that participation in the treatment ought to be open to all those who had good credentials, and should certainly not be reserved for members of hospital staffs. Dr. DAIN cleared up the position by quoting certain criteria of a specialist—namely, that he should satisfy one or more of the following conditions:—

> 1. That he holds or has held hospital or other appointments affording special opportunities for acquiring special skill and experience of the kind required for the performance of the service to be rendered, and has had actual recent practice in performing the service to be rendered or services of a similar character; (2) that he has had special academic or post-graduate study of a subject which comprises the service to be rendered, and has had actual recent practice as aforesaid; or (3) that he is generally recognised by other practitioners in the area as having special proficiency and experience in a subject which comprises the service to be rendered.

This definition was accepted by the meeting, and Dr. JONES was assured that it did not preclude panel practitioners from being recognised as suitable persons to give treatment of the kind contemplated. Dr. E. SOLLY (Harrogate) said that there was now a very strong movement towards the provision of so-called spa treatment for insured persons, and on no account must this treatment be given by persons with no special experience.—Dr. F. G. THOMSON (Bath) explained what services the spa physician would render, and after Dr. DAIN had summed up the case in its favour, the scheme was approved with only two or three dissentients.

What is a Spa?

An entertaining discussion arose on an attempt by the Council to define spa treatment as "treatment at a place possessing a supply of natural mineral waters of reputed therapeutic value with facilities for their application. This implies the existence of suitable buildings, apparatus and trained personnel for work in bathhouses and other physiotherapeutic departments." Dr. E. WARD, for Torquay, moved that the word "mineral" should be deleted so that the definition might include sea-water, and this

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT CARDIFF.

REPRESENTATIVE MEETING: JULY 21ST-24TH.

(*Continued from p. 196.*)

Lunacy Law Reform.

Dr. R. L. LANGDON-DOWN, Chairman of the Committee on Lunacy Law and Mental Disorder, introduced the Council's memorandum on the Report of the Royal Commission published in 1926. He said that the Council did not regard as satisfactory the proposal that mental patients should be classified as "voluntary" and "involuntary." The Commissioners recommended that those who entered a mental institution on their own initiative should be termed voluntary patients whilst all the others were to be placed under compulsory treatment only after medical examination and on the order of a magistrate. Thus the proposed Provisional Treatment Order, except in the case of the voluntary boarder, involved the intervention of a legal official at the outset for every patient who required institutional treatment. This was by no means desirable, as the memorandum pointed out; in fact, if the early treatment of mental disorders was to be realised, legal intervention should be limited to cases in which the patient, *though capable of volition, definitely refused and resisted* institutional treatment. There were numerous patients in whom the will was in abeyance; many of these made an early recovery, and they ought if possible to be saved from the stigma of certification. The Council thought that they should be admitted to appropriate institutions on an "authorisation for treatment" given by a relative or friend and supported by the recommendation of two practitioners. On such terms it would be possible to get relatively early treatment, whereas the Commission's plan, by continuing in this respect the formalities of the existing law, would discourage a patient's relatives from taking steps in good time. The intervention of a justice was the great deterrent to early treatment at the present time.

Dr. DAVID ROXBURGH, for Marylebone, proposed that the report be referred back for further consideration on the ground that the Council had not "taken steps to promote legislation which would protect the certifying practitioner from vexatious litigation." There was, he said, a sword hanging over the head of anyone signing a certificate of insanity, and it must somehow be removed. Sir Frederick Willis, the late Chairman of the Board of Control, had stated in the press that the Board had for ten years been making strenuous efforts to get the law of lunacy altered, but public apathy had always resulted in measures of reform being crowded out of Parliament. As a powerful body like the Board had failed in all this long time to get anything done, the only thing left to the profession was to frighten the public into taking an interest in the subject. This could be done if medical men as a body would threaten not to continue the certification of the insane, and to do this would be a public service.

Dr. Roxburgh's motion to refer the report back to the Council was lost.

Dr. TEMPLE GREY did not approve of the Commissioners' statement, quoted in the memorandum, that "insanity is, after all, only a disease, like other diseases. . . ." This was not true from the point of view of diagnosis—the point of view of the general practitioner. In cases where the judicial authority intervened to secure detention in the public interest for persons of unsound mind, that authority ought, he considered, to accept responsibility for such detention.—Dr. LANGDON-DOWN said that proposals of this kind lost sight of the other functions performed by doctors under the Lunacy Act. A magistrate could not take over a medical man's whole responsibility, since the latter would always be liable to an action for lack of care in making out the certificate. It would be wholly unsatisfactory, indeed, if the doctor were released from the duty of taking care.—To this Dr. GREY replied that absolution from the duty of care did not mean the right to be careless. He thought that a magistrate should always be called in if the patient proved resistant, and in the comparatively small proportion of cases where this happened, the law should accept the responsibility. After some further discussion this view was accepted by the meeting, which passed the following resolution, to be added as a rider to the Council's report:—

> That the Representative Body, whilst thanking the Lunacy Law and Mental Disorder Committee for their Memorandum, considers that further protection for the certifying medical practitioner is required; that is to say, that the judicial authority when it intervenes shall accept responsibility for the detention of persons of unsound mind.

Dr. W. JOHNSON SMYTH and Dr. E. K. LE FLEMING, for Bournemouth, put forward another amendment to the original motion accepting the memorandum. This ran as follows:—

> That if, under Sections 13 and 16 of the Lunacy Act, 1890, a magistrate make an order to one or two medical men as the case may be (two medical men under Section 13 and one under Section 16) to examine a person believed to be of unsound mind, it should be considered that the magistrate should be solely responsible as an instrument of the law and the doctors should have the status of a witness and enjoy the immunities of a witness.

Dr. GREY had previously pointed out that the words "status of a witness" could not be applied in the circumstances; properly speaking, no one but a witness could have the status of a witness. The Bournemouth amendment was, however, carried, after references to Section 16 had been deleted.

Conflicting Medical Evidence in the Courts.

Dr. R. G. GORDON, for Bath, drew attention to the Assize Court's decision in the case of Tyndall *v.* Alcock. Heavy damages had been given against Mr. Alcock, largely on evidence which seemed to be wise after the event, and on appeal the judge had said in so many words that if the original decision had been in the hands of himself and his colleagues, the result would no doubt have been different. As no new facts had emerged he was, however, unable to reverse the opinion of the jury. Dr. Gordon invited the Representative Body to say that it regarded the case with consternation since it "would seem to expose any surgeon who, although operating in good faith and with due precautions, failed to obtain a perfect result from his operation to be found in damages by a jury of laymen." It was, he said, impossible to expect that the jury system would be altered, but a certain amount of abuse was creeping into the practice of giving medical evidence in the law courts, and it was desirable that the question should be ventilated. Possibly a medical assessor—an "impartial person"—ought to sit with the judge to help him in the weighing of technical evidence. On behalf of Bath he proposed that the Council should consider "whether means cannot be found to ensure that expert witnesses appearing on opposite sides in a case shall not so confuse the issue by a divergent representation of facts that a lay jury cannot assess these facts at their true value."

The meeting asked Mr. O. Hempson, the Association's solicitor, to express an opinion on this proposal, and he thought that, if passed, it might well be quoted against members of the profession in cases of alleged negligence. It would always be possible for litigants to obtain the services of a certain class of medical man, and the weight of such witnesses' opinions would be increased if they could be represented as men who had courage enough to put the interests of truth before those of their profession. Mr. Hempson believed that it would be a great mistake to pass a resolution suggesting that the B.M.A. deplored medical men giving evidence against each other.

Dr. Gordon consented to withdraw his motion.

impossible to please both parties.—Dr. **Temple Grey** urged postponement. He did not like the suggestion that the central consultative council should be set up by the Ministry of Health.—Mr. **H. S. Souttar**, however, said that if the Association's decision was to be of any value it must be sent to the Minister at once. It was surely obvious that there must be some consultative body to coördinate hospital work. The object of having base hospitals was to save waste of time and energy; they were not going to take "good" cases, but were going to set an example of what could be done, and were going to help others in every possible way. Whilst it was the duty of public hospitals to take all and sundry patients, it was the duty of voluntary hospitals to supply the highest possible level of medical service, to provide education for medical men, and so far as possible to assist the public services.

Dr. **C. E. S. Flemming** saw no reason to fear that the State would want to control voluntary hospitals. Even State aid would not necessarily mean State interference.—Sir **Richard Luce**, M.P., said that coördination would be impossible without the intervention of some outside body, representing the interests of all concerned. Cottage hospitals, fever hospitals, and the rest would look to the base hospitals as educational centres, and they would be a very important element in post-graduate work.—Dr. **Fothergill** was much more frightened of State hospitals than of voluntary hospitals, the majority of which in this country were staffed by general practitioners.—Dr. **R. C. Buist**, speaking as a member of the Voluntary Hospitals Commission, said he had signed with a heavy heart that section of the Commission's report which dealt with financial assistance of the voluntary hospitals from mass contributions. When the poor-law hospital became municipal and lost its stigma, it would inevitably come into competition with the voluntary hospital, and if its service was adequate it would win sooner or later. People who provided treatment for themselves by paying rates would eventually drop out of contributory schemes.—Dr. **A. B. Murray** pointed out that already very few hospitals were truly voluntary; their work on venereal diseases, child welfare, ophthalmia neonatorum, and in other directions was State-aided. Whereas in big hospitals the voluntary staffs, in giving their services, were only casting bread upon the waters, practitioners who joined the staffs of small country hospitals did their work for nothing and got no indirect return. Much of this work should be paid for—a suggestion which had found no place in the memorandum.

While summing up in favour of referring back the memorandum to the Council, Dr. **Masterman** said that in his Division there were 2400 beds belonging to public authorities, and no voluntary hospitals. Every practitioner was welcome to come in, examine, and talk over his case. He visualised, in the future, an annexe in State hospitals where practitioners could definitely undertake the treatment of their own patients.

The amendment being lost by a large majority, the meeting approved the Council's memorandum. Further discussion took place on the criteria for practitioners treating private patients in private wards or nursing homes attached to hospitals, but this question was referred for further consideration

Other Subjects Discussed.

The following motion by Edinburgh and Leith was approved without discussion:—

(1) That in the interest of the public health the British Medical Association support any measures which may be taken so to alter or amend existing legislation as to give greater power to local authorities to suppress unnecessary noise which is disturbing to the lieges; and (2) that any noise from 11 P.M. to 6 A.M. which is capable of being prevented or mitigated and which is dangerous or injurious to health, shall be a nuisance within the meaning of the Public Health Acts.

A resolution passed in 1926, saying that in accident cases treated at a voluntary hospital, where medical attendance is covered directly or indirectly by insurance, "the hospital authorities should recover from the insurance company the full cost of maintenance and treatment," was amended by deletion of the words "from the insurance company."—Buckinghamshire carried a motion asking the Council to consider whether some arrangement could be made for payment for the emergency services rendered by doctors to patients meeting with accidents on the roads.

In introducing the report of the Naval and Military Committee, Dr. **F. W. Goodbody**, the chairman, advised that careful inquiries should be made at the present time before advising medical men to enter the Indian Medical Service.

Dr. **C. L. Leipoldt**, Secretary of the British Medical Association in South Africa, referred to the need for improving post-graduate education in England. Practitioners from the Dominions regarded themselves not as students but as the equals of any practitioner in this country. They therefore did not appreciate the instructive methods of specialists at the big teaching hospitals in this country.

At the end of the meeting a cordial vote of thanks was passed to Dr. Hawthorne for presiding, and to other officials who had worked for the comfort and convenience of the meeting.

THE ANNUAL MEETING.

At the annual meeting at the City Hall on July 24th the outgoing President, Sir Robert Philip, handed the insignia of office to his successor, Sir Ewen Maclean. The President-elect, Prof. A. H. Burgess, was introduced to the assembly. At the adjourned annual meeting, held at the New Theatre on the evening of the same day, the new President delivered the address published in our last issue. The Sir Charles Hastings Clinical Prize was awarded to Dr. Ambrose Owen, the Stewart Prize to Sir Malcolm Watson, and the Katherine Bishop Harman Prize to Dr. Ronald Hare.

THE RELIGIOUS SERVICE.

At the official church service, held at St. John's Church on July 24th, the sermon was preached by the Rev. Garfield Williams, M.B., honorary Canon of St. Albans, who spoke on the character of St. Luke. Even yet, he said, the Church had not realised the importance of what might be described as the extra-professional activities of that travelling physician of the first century. He was the greatest biographer of our Lord, so far as pure biography was concerned; he was the first and greatest of Church historians, and he was the companion and guardian of Paul the missionary. He had the practical mind of the physician, and he thought out the ways and means whereby the visions of his companion Paul might be carried out into action. One side of his character to which the preacher drew attention was his interest in persons—in personal details, at all events those which were important. That was true of the physician always. He did not treat diseases, in spite of what the public might suppose; he treated persons.

THE ANNUAL DINNER.

More than 500 people attended the annual dinner of the Association, held at the City Hall on July 26th, when Sir Ewen Maclean presided, and the guests included the Lord Mayor and Lady Mayoress of Cardiff, the Marquis and Marchioness of Bute, the Archbishop of Cardiff, Dr. Franklin Martin (director-general of the American College of Surgeons), and Sir George Syme (president of the Federal Committee of the B.M.A. in Australia).

Proposing the health of the City of Cardiff, Mr. R. G. Hogarth said that, like many other visitors, he had imagined Cardiff as a city of smoke and ugliness; he found it endowed with civic buildings unrivalled in many a European capital. It was interesting to think of all these beautiful and proposal was warmly seconded by Dr. JOHNSON SMYTH, of Bournemouth, who also drew attention to the excellent facilities provided for the treatment of rheumatism at certain seaside resorts.—Dr. BRACKENBURY protested vigorously against this tampering with the definition. It would mean, he said, that nearly every town and village round the coasts of the Empire could claim to be a spa—and most of those inland as well. But the claims of seaside watering-places had made a strong impression. and Torquay's amendment was carried. A proposal by Mr. BISHOP HARMAN to destroy its general effect by inserting the word "approved" before "water" was rejected with ignominy, but Dr. BRACKENBURY eventually managed to persuade the representatives that the amended version was unsatisfactory, and the definition was referred back to the Council for further consideration.

Contract Rate for Juvenile Oddfellows.

A lively debate arose on the Council's decision that a standard rate of 8*s.* 8*d.* per head per year, including drugs, was acceptable for medical attendance on juvenile members of the Manchester Unity of the Independent Order of Oddfellows. This body has found its numbers diminishing through insufficient entries into the juvenile lodges. Failure of recruiting has been due to medical benefit being no longer given in many areas because it costs too much, and the Manchester Oddfellows have approached the B.M.A. to see whether such benefit cannot be provided at an economic rate. The policy of the Association has been that the same fee should be paid as under the National Health Insurance Acts—namely, 9*s.* plus 2*s.* 3*d.* or thereabouts, including medicine—but this policy, Dr. BONE reported, has been more honoured in the breach than the observance. There were few areas, he said, where anything like a capitation fee of 8*s.* 8*d.* had been obtained for dependants of the classes insured under the Health Insurance Acts, and the Council thought that it was a fair fee for the particular work to be done. There were in the Society 151,000 juvenile members, and the capitation fee at present being paid on their behalf was between 6*s.* and 7*s.* The profession would gain some £20,000 by a uniform rate of 8*s.* 8*d.*, and in comparing this rate with fees received in the public medical service it must be remembered that there would be no deduction for the costs of collection and expenses generally, and that the service given would be relatively restricted as the children were under 16 years of age and needed less attention. Dr. BRACKENBURY said that the advantage of getting rid of records, of the need of certification, and of the disciplinary machinery was more than equivalent to any drug fees the practitioner would get if he had to provide the patients with medicine. He thought that 8*s.* 8*d.* was at least equal to the fee now being received under the Insurance Act.

This view was challenged by several representatives, whilst others maintained that 13*s.* per head per annum could be secured in many areas. Some pointed out that children should receive more and not less attention than adults. Dr. LEWIS LILLEY, for Leicester and Rutland, moved that the standard rate be approved "always provided that in any area in which a higher rate at present is paid this rate shall be allowed to stand, due regard being given to the special conditions and scope of service rendered in such area." But this amendment was lost, and the meeting finally approved the Council's resolution by a majority of 81 to 63. This resolution not only agreed to the standard rate of 8*s.* 8*d.*, but also authorised the Council to approve a slightly lower rate in areas where, owing to economic conditions, the standard rate was not feasible. It laid down "that it be an essential part of this arrangement that there must be free choice of doctor by patient and of patient by doctor."

As the vote did not show the necessary two-thirds majority in favour of the resolution, it will not become part of the policy of the Association.

Coördination of Hospitals.

The Council having approved a memorandum for presentation to the Minister of Health, this was introduced to the Representative Body by Mr. MCADAM ECCLES, Chairman of the Hospitals Committee. It outlines a scheme based on the assumption that poor-law hospitals will shortly come under the control of county and borough councils. The first step in coördinating their work with that of the voluntary hospitals must, in the Council's opinion, be the establishment of a central advisory authority appointed by the Ministry of Health. This "central consultative hospitals council" should map out the country into areas—each served by an "area coördinating hospital committee"—containing both voluntary and municipal hospitals. These would again be subdivided and, as suggested in the Interim Report of the Consultative Council on Medical and Allied Services, 1920 (the Dawson Report), all the hospitals in a given district would be grouped round a central or base hospital—generally one of the bigger voluntary hospitals. This would be expected to set the standard of hospital practice and be the chief centre of education and research. As the "area coördinating hospital committees" would generally cover districts too large for administrative control, each group of hospitals would work under the direct advice—and in some respects administration—of a group hospital committee. A public hospital, when not itself the central or base hospital, should develop in coöperation and not in competition with the voluntary hospital. The responsibility for treatment in public hospitals could be undertaken by a visiting medical staff (on a part-time basis) with the assistance of a resident medical staff; but practitioners treating patients for whom the Government or local authorities are responsible, should receive either an honorarium or a fixed salary for definite services and responsibility.

A proposal to refer the memorandum back to the Council for further consideration was made from different points of view by Dr. E. W. G. Masterman, for Camberwell, and by Dr. Graham Little, M.P.

Dr. MASTERMAN said that this was a consultants' scheme. In the opinion of all the medical superintendents of poor-law institutions it was "impossible" and it would wreck all attempts at coöperation and helpfulness. He was all in favour of the voluntary system, but if the voluntary hospitals kept out of the State service they could not expect quite the same consideration as if they were in it. In the scheme, the base hospital should logically be the State hospital, because this was obliged to take any patient requiring treatment, whereas the voluntary hospitals, especially those with students, were obliged to select their cases. He did not believe, however, that it was wise to put any hospital in a primary or superior position in a district. Nor could he approve the suggestion that in public hospitals responsibility for treatment should be taken by the visiting staff. In public health hospitals at the present time there was a whole-time regular staff and consultants were only called in when necessary.

Dr. GRAHAM LITTLE pointed out that the Dawson Report had been published eight years ago when the situation of the voluntary hospitals was desperate. Now 75 per cent. of those in the provinces, and 60 per cent. of those in London, had balances at their banks. It was dangerous to give this opening to the Ministry of Health for controlling the voluntary hospitals, and it would be very regrettable if the policy of the Association were to weaken the voluntary system.

Dr. M. W. RENTON (Stratford) complained that the threshold of the voluntary hospitals was too often closed to general practitioners. There was a mistaken idea that the whole of the work should be done by consultants.—Mr. BISHOP HARMAN contrasted the views of Dr. Masterman and Dr. Little in their opposition to the scheme. It would be a definite lesion of the myocardium—178 presented fibrosis, 12 fibrosis and fatty change, and 48 fatty change alone. Atheroma was the most frequent lesion and caused fibrosis in 51·2 per cent. of cases. Many of the cases illustrated the remarkable adaptability of the anastomotic channels under favourable conditions. From this study, in addition to general information regarding frequency and effects of lesions, three points emerged: (1) severe coronary narrowing might be present without obvious lesion in the myocardium; (2) old-standing severe arterial lesions and actual occlusion with fibrosis might occur with no clinical history pointing to it; (3) patients might die with symptoms suggesting coronary artery occlusion and no such lesion be found. There was no diagnostic symptomatology which would cover all cases of coronary disease. When the blockage was abrupt certain features were present. Hamman divided cases into six classes: (1) sudden death; (2) death in a few hours; (3) continued myocardial insufficiency with death in weeks or months; (4) recovery after grave symptoms; (5) cases that were not grave but recognisable; (6) mild or uncertain cases. He would leave symptomatology to other speakers. The prognosis was grave, but owing to difficulties in diagnosing mild cases, the proportion of recoveries could not be stated. In treatment they must distinguish between treatment of the actual disease and treatment of a complication, such as thrombosis, arising in the course of that disease. In thrombosis the first indication was to relieve the pain. Morphine was required, often in large doses. Digitalis was sometimes of benefit. He himself had been impressed with the value of glucose in strengthening the heart, but had not been able to follow a sufficiently large series of cases to speak dogmatically. He gave half a pound daily. Treatment of actual disease of the coronary arteries resolved itself into prevention of such conditions as atheroma and arterio-sclerosis. This could not be efficient until their ætiology was better known.

Ischæmia and Infarction.

Dr. **Carey F. Coombs** (Bristol) based his remarks on cases seen as in-patients. He defined two chief coronary syndromes, ischæmia and infarction. In ischæmia there was substernal pain, excited by exertion and relieved by rest. In infarction the substernal pain was continuous. These groups were clearly defined, although it was difficult to draw a line between them, since a case of ischæmia might pass over into one of thrombosis. The age-incidence of ischæmia and infarction corresponded fairly closely but the highest peak of the curve for ischæmia occurred about a decade earlier than that for infarction. The reason for this was that ischæmia was generally due to syphilis, which caused nipping of the orifice of the coronary arteries but rarely led to infarction, whereas degenerative conditions, especially atheroma, caused destruction of the intima and infarction. With regard to sex-incidence, males preponderated to the extent of 71 per cent. in ischæmia and 82 per cent. in infarction. Most of the females in the ischæmic group had high arterial tension, but this was not so for the males. The effect of heredity could not be statistically proved, as it was difficult to get accurate family histories. The patients died at an advanced age (60–70), so that the family history had been forgotten. Nevertheless, there was a decided family incidence; several examples were quoted.

The ætiology of coronary disease was graphically shown. Rheumatism and ulcerative endocarditis seldom produced gross lesions, for although much damage to vessels was found microscopically, there was, as a rule, no interference with the blood-supply. Very interesting were the infective group of cases, of which the speaker had seen several examples occurring about the age of 40 and often associated with phlebitis. Most of the cases were of the degenerative type and arose from circumstances over which they had little or no control. With regard to treatment, he had found caffeine and diuretin of value in patients who suffered from cardiac pain on slight provocation.

Dr. **Ivor J. Davies** (Cardiff) emphasised the importance of looking for arterio-sclerosis or atheroma in clinical examination of patients. Burns, in 1809, had compared the diseased heart to a limb round which a moderately tight ligature had been tied. Ordinary work could be carried out, but further exertion produced the symptoms of intermittent claudication. Intermittent claudication was the probable cause of the pain of coronary disease. True cardiac pain did not occur in valvular disease unless decompensation was also present. The character of the pain was important. It tended to be epigastric in coronary thrombosis, hence the liability to confusion with abdominal disease. Angor animi was pathognomonic of coronary disease and emotional stress was often an exciting cause of the pain. The speaker then gave an account of the symptoms and physical signs of thrombosis, laying special stress on restlessness, especially if it occurred in a patient already suffering from heart disease.

Diagnosis and Prognosis.

Dr. **A. G. Gibson** (Oxford) dealt with diagnosis and prognosis. Coronary disease should be suspected in cases of: (1) serious pain in the chest; (2) acute cardiac failure with fainting attacks; (3) acute pain in the upper abdomen with an irregular heart. It was necessary to distinguish between angina and coronary disease. In the former the pain came on during exertion and lasted for minutes, dyspnœa was absent, and the blood pressure was normal or raised. In the latter the symptoms lasted hours or days; there was vomiting, abnormal pulse-rate, low blood pressure (especially low pulse pressure), and, later, fever and leucocytosis. In some cases there was acute cardiac failure with pallor, sweating, restlessness, and entire absence of pain. Fainting attacks in persons over 40 should be regarded with grave suspicion. The blood pressure, pulse-rate, and response to exertion should be watched. The distinction between coronary thrombosis and acute abdominal conditions might be difficult. If they occurred together it was better to operate, for the administration of an anæsthetic, although the risk was greater, did not present insuperable difficulties. Coronary disease might be suspected in chronic cardiac failure occurring in older people. But however careful they might be in diagnosis, there would be some cases impossible to identify during life. With regard to prognosis, figures did not help much until the different factors concerned in the condition could be separated. Patients who recovered from an attack of thrombosis might live many years even with extensive fibrosis of the heart muscle. Specimens of hearts from two such cases were shown.

Dr. **John S. Campbell** (Belfast) showed a series of X rays of hearts in which the coronary circulation had been injected with an opaque emulsion. Age changes were illustrated by a fœtal heart where the right and left ventricles received an equal blood-supply, the heart of a man of 50 showing decreased vascularity of the right ventricle, slightly tortuous arteries, and better developed anastomoses, and that of a man of 75 where these changes were much more marked. The next series dealt with anastomoses developing after coronary thrombosis. In one case of thrombosis of the right coronary and circumflex the whole of the arterial tree distal to the block had become filled with injection material through anastomoses with branches of the left coronary. Diagrams of variations in the areas supplied by the two coronaries were also shown.

Dr. **D. Evan Bedford** (London) spoke of electrocardiographic changes and described the typical curves found in coronary thrombosis. Widening of the curves, splintering or notching of the waves, and low voltage were common in coronary disease. He showed electrocardiograms taken two days and four days after coronary thrombosis. Besides the above, concordant buildings as an expression of the coal trade, now going through a time of trouble, and he trusted that the courage which had made Cardiff great would stand by her in the present difficulties. In his response the Lord Mayor said that they were all hoping that the day would come when Cardiff would be recognised as the capital of Wales, and they had already reserved a site for the National Parliament. Meanwhile Cardiff would appeal to the medical profession because it was a city without a slum. There was not one house in it that the Ministry of Health would condemn.—Dr. H. B. Brackenbury replied to the health of the British Medical Association, proposed by Sir William Seager, and Dr. C. O. Hawthorne, giving the health of the guests, coupled the toast with the names of Sir William Diamond (chairman of the Board of Management of the Cardiff Royal Infirmary) and of Sir George Syme, both of whom responded.—Dr. W. E. Thomas wittily proposed the health of the President, Sir Ewen Maclean, who was, he said, the first ex-chairman of the Representative Body to rise to this high office.—After this health had been drunk with musical honours, and Sir Ewen had replied, the proceedings ended with the National Anthem.

THE SOCIAL SIDE.

The principal building of Cardiff is the Castle, owned by the Marquis of Bute, which comprises a large Roman fort, a Norman keep, and residential buildings belonging to nearly every English architectural period. The grounds extend for several miles towards Llandaff and the part now called Cathays Park has been made over to the city as a site for national and municipal buildings. These include the Law Courts, the County Hall, the Technical College, the Welsh National Museum, the University College of South Wales and Monmouthshire, and the City Hall. In the centre lies the National War Memorial, and the whole group of buildings, constructed in Portland stone and separated by open spaces and wide avenues, is unlike anything to be seen elsewhere in this country.

The scientific sections met at University College and in the Technical College, but most of the social functions, and the Representative meeting, were held in the City Hall. On Tuesday evening the Hall was used for a reception by the President and local executive, and on this occasion a birthday present was given by the Association to the Earl of Dumfries, Lord Bute's eldest son, who was celebrating his coming-of-age. On the following evening the Hall was again used for a reception and dance, the host this time being the Lord Mayor.

On Wednesday afternoon there was a reception at the Cardiff Royal Infirmary; on Thursday Lord nd Lady Bute entertained some 6000 guests in the Castle grounds; and on Friday evening the National Museum, at an official reception, displayed its many beautiful treasures, together with a special collection llustrating the history of Welsh medicine.

On Sunday the Representative Body enjoyed an xcursion to St. Donat's Castle, where a religious ervice was held in the courtyard. Before setting out the Representatives attended at the National War Memorial, where the President-elect laid a wreath on behalf of the Association. Many expeditions to places n the locality, including the Docks and the Bargoed Colliery, were arranged during the subsequent week. The Popular Lecture was given at the New Theatre n Friday evening by Sir Berkeley Moynihan, who poke on Art in Medicine, and on Friday the honorary egree of Doctor of Laws was conferred by the University of Wales on Sir Robert Philip, Dr. H. B. Brackenbury, Dr. W. W. Chipman (Professor of Obstetrics at McGill University), Sir Thomas Lewis, Dr. Franklin Martin, and Sir George Syme.

THE ANNUAL EXHIBITION.

An account of the exhibition, which was formally pened on Tuesday by Sir Ewen Maclean, will appear a forthcoming issue of THE LANCET.

SECTION OF MEDICINE.

Sir THOMAS LEWIS, who presided at a discussion on

DISEASES OF THE CORONARY ARTERIES,

remarked that the dictum, "a man was as old as his arteries," contained a considerable element of truth, especially if it was applied to the cerebral, renal, and cardiac vessels. The coronary arteries had been the subject of discussion on several occasions in these meetings as well as elsewhere, but many problems concerning them were still wrapped in obscurity. Disease of the coronaries always interested medical men, for many notable physicians had been affected by it. John Hunter, and in modern times Sir James Mackenzie, were two out of many examples. The western counties had a peculiar interest in the condition, for the earliest and some of the most important observations on coronary vessels had originated there. 160 years ago Heberden gave the first clear description of coronary disease. Its connexion with angina pectoris was first pointed out to Edward Jenner by a surgeon living in Ross, who did a post-mortem on a case of angina and noted disease of the coronary arteries. Jenner wrote his opinion on this to Heberden in a private letter, but his views were never published, out of consideration to his friend, John Hunter. There had been great advances in recent years, in two directions especially. The first was in the study of the anatomy of the vessels of the heart and their anastomoses in heart muscle. The second was the precise study of the symptoms and signs of coronary thrombosis. This was bound to throw light on our knowledge of angina pectoris.

Dr. GEORGE A. ALLAN (Glasgow) began his opening address by defining the limits of the discussion. Speakers must beware of detracting from the value of the main subject by excursions into theories of angina pectoris. Nor must they narrow the outlook by concentrating on one aspect alone of coronary disease, such as coronary artery thrombosis. He then surveyed some of the essential features of the subject.

The association of special symptoms with occlusion of the coronary blood-supply had been recognised since 1878, but only in the last few years had a clear distinction been established between it and the more widely recognised syndrome of angina pectoris. Very important anatomical investigations had been made by Gross and his collaborators, who concluded that the heart was perhaps the richest organ in capillary and precapillary anastomoses. From the morbid anatomy point of view there were four clearly defined diseased conditions of the coronary arteries: atheroma, arterio-sclerosis, syphilis, and calcareous degenerations. These terms were often so loosely used that it was necessary to define them. Atheroma, the commonest primary lesion in the coronaries, had a patchy distribution. It was the same disease as atheroma of the aorta and had the same tendency towards ulceration and thrombosis though in a less degree. Atheroma was very irregular in its distribution in different vessels. The coronaries and other deep arteries might be affected, while the superficial arteries might give no indication of its presence. Arterio-sclerosis was a more diffuse process characterised by thickening of the media and intima. It was the same as arterio-sclerosis associated with high blood pressure and might, or might not, cause narrowing of the vessel. Syphilis, though common in the aorta, was rare in the coronaries. They were, however, liable to be occluded at their point of origin by syphilitic mesaortitis. Calcification might be superimposed on either atheroma or arterio-sclerosis, or might occur as a primary medial degeneration. The deformity it produced in association with atheroma frequently caused narrowing of the lumen with or without thrombosis.

With regard to the relative frequency of the conditions, the speaker found that out of 1000 post-mortems at the Western Infirmary, Glasgow, coronary artery disease was found in 371. Of these 238 showed

(1) when marked disparity existed between head and pelvis, hardly ever when the head was still movable above the pelvic brim; (2) without an exact knowledge of the position of the head; (3) until the cervix was completely effaced and retracted over the presenting part. It would be a counsel of perfection to forbid the application of forceps except on strict indications, but greater care and discretion in their use was a reasonable ideal.

The Importance of Antenatal Care.

Prof. James Hendry (Glasgow) pointed out that public interest in puerperal morbidity was thoroughly aroused, and that there was no doubt whatever that the doctor was held responsible. Dr. Miller had provided the records; he himself would attempt to consider to what extent more efficient antenatal care would have prevented these accidents.

In most of the cases of disproportion, contracted pelvis and not an abnormally large child had been the cause. This could nearly always have been identified in early pregnancy; skeletal irregularity was an important danger-signal. Internal examination was essential, and the form of the pelvic outlet should be noted; a sharp subpubic angle with reduced distance between the tuberosities indicated contraction at the outlet and might pass unnoticed until late in labour. Examination of the diagonal conjugate diameter should always be attempted. It might be difficult in the early months, but was usually possible during the seventh or eighth, especially if the patient "bore down," relaxing the perineal muscles. Short fingers were not really a handicap. The fingers should also sweep round the pelvic brim to detect asymmetrical deformity, a small transverse diameter, or ovarian cysts or fibromyomata. Towards the end of the pregnancy a pendulous abdomen in a primigravida should arouse suspicion. If the head failed to descend into the pelvic cavity during the last month the cause might be faulty presentation, neoplasm, or even placenta prævia, but was often contracted pelvis. The history of previous labours was most valuable. X rays were not of much help, except possibly in the generally contracted pelvis, when Prof. Martin's method was of value.[1] At this stage the fœtal head was the best of all pelvimeters. The method of election, that of Müller, should be performed under an anæsthetic during the last month. In contracted pelvis, however, the position of the head would not indicate how it would mould or alter its position in labour, and Munro Kerr's method of pelvimetry gave a far more reliable prognosis. In labour, if forceps were decided on, a most careful re-examination should be made, if necessary with the hand in the vagina, after the patient had been anæsthetised, and if great difficulty were then apparent the use of forceps should be foregone. Rectal examination was safer than vaginal examination, and just as satisfactory. In borderline cases, if progress were not satisfacory after a good long labour, the lower segment Cæsarean section should be performed.

Occipito-posterior presentations were usually identifiable by careful antenatal examination. Where palpation was difficult two X ray photographs, frontal and lateral, should give a complete diagnosis. Dr. Haultain had secured permanent correction by pads and a binder in 87 per cent. of primigravidæ, and 83 per cent. of multiparæ.[2] 60 per cent. rotated spontaneously, but it was important to recognise the association of this condition with protracted labour. It was often accompanied also by slow dilatation of the cervix. Other abnormal presentations, or the deformities which would cause them, were practically all identifiable before labour. Hydrocephalus was easily detected, except when obscured by hydramnios, and perforation might prevent an exhausting labour. Manual dilatation of the cervix was seldom justified, and, even when attempted, was hardly ever complete.

Antenatal examination of this kind could often be carried out by the general practitioner, but there was need for efficient consulting centres. The work was far too responsible and difficult for midwives, and no midwife should be authorised to undertake the care of a pregnant woman unless provision were made for careful examination by a medical practitioner before labour were due.

Prof. W. Fletcher Shaw remarked on the large number of craniotomies in the series compared with Cæsarean sections, in spite of the increased use of the section by every obstetrical unit. Performed upon a "clean" patient its mortality was very low, but after attempts at forceps delivery it was highly dangerous. Many patients were badly lacerated, and others were shocked; some were definitely infected, and in some cases the child was dead or damaged. Pubiotomy had never become popular, and was only useful when a small amount of widening would make the difference between retention and expulsion. Miscalculation of the amount led to severe laceration.

The main reasons for failure in forceps delivery were professional and lay apathy. Obstetrical teaching was relegated to a subordinate position, and the public did not realise how difficult maternity cases were. Remuneration was poor, and the relatives looked down upon a doctor who called in expert assistance. It was necessary to educate the public and to provide more and sounder clinical teaching. Stress should be laid on four points: antenatal care, asepsis (Prof. Shaw condemned coal-tar derivatives), resistance to the relatives' importunity in the first stage of labour, and definite diagnosis before applying high forceps.

Discussion.

Dr. Charles Douglas (St. Andrews) appealed to general practitioners to shoulder the responsibilities of antenatal work, and warmly recommended version as an effective stand-by when hospitals were far off, with the stringent proviso that the os should be fully dilated. Chloral was very valuable in securing dilatation. Even after forceps had failed, version would often safeguard future maternal efficiency.

Prof. Bethel Solomons (Master of the Rotunda Hospital, Dublin) put most unsuccessful forceps cases down either to abysmal ignorance or to wilful negligence. The first could be removed by training, especially on the management of the all-important first stage; the second should be punished by legal process. Failed cases should be distinguished from cases where forceps had been used tentatively with a view to later pubiotomy or lower segment Cæsarean section. The present curriculum was too short, and an extra year should be allotted to the post-graduate study of obstetrics. He deprecated Dr. Miller's classification of "children dead or dying on admission." It was impossible to tell whether a child was dying, and the impression that it was possible would lead to a far too free use of the cephalotribe. The man who had strength of mind to avoid forceps when contra-indicated, and strength of arm to deliver the head when they were indicated, would have no failed cases. In the Rotunda there had only been 10 in 6000 or 7000 deliveries.

Dr. Mabel Ramsay (Plymouth) viewed craniotomy with horror, and recommended section, even after forceps had failed. Antenatal schemes broke down because the patient would not realise their value; moreover, the officers in charge were often inadequately trained.

Dr. F. Edge (Birmingham) saw a solution in compulsory antenatal consultations with adequate remuneration.

Mr. L. C. Rivett (London) urged four conditions for applying forceps: engagement of the head, full dilatation, passage of the greater diameter through the cervix, and an empty bladder. Neither version nor craniotomy should be performed when the liquor amnii had drained away and the uterus was in an they were characterised by absence of the T-wave and a plateau following the R-wave in lead 2. A few weeks later there was a change. The T-wave was inverted in either lead 1 or lead 3, and was flattened in lead 2, but to a less degree. After 17 months in the case shown there was still inversion widening and notching, but the curve then began to change in the direction of the normal. Eventually normal curves were obtained. One great value of electrocardiograms was that they strengthened the physician's hand when he insisted on prolonged treatment after an attack. Patients often tried to work as soon as the acute stage had passed, and it was important to prevent this.

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[1] Zeitschr. f. Geburtsh. und Gynäkol., 1927, xci., 3, p. 504.

[2] Proc. Edin. Obstet. Soc., 1926, p. 133.

In the discussion which followed, Dr. Bain said that coronary spasm had been advanced in France as the cause of cardiac pain. It was difficult to see how sclerosed arteries could go into spasm. He would like to ask, however, whether spasm could be the cause of angina without coronary disease.

Prof. T. G. Moorhead (Dublin) was interested in Dr. Coombs's infective group of cases in which angina was associated with phlebitis. He had published a case of thrombo-phlebitis migrans, in which phlebitis had begun in the leg, then attacked various regions of the body, and, finally, coronary thrombosis had occurred. The patient was now in good health.

Dr. A. R. Gilchrist (Edinburgh) called attention to a group of cases in which angina was associated with paroxysmal tachycardia. He doubted whether as much could be deduced from electrocardiograms as was sometimes thought. He had one case which showed inversion of T-waves in several attacks and was diagnosed coronary thrombosis. Post mortem no occlusion of either coronary was found. The pain was probably due to paroxysms of tachycardia. Electrocardiographic records were seldom confirmed post mortem and often none had been taken before the attack.

Dr. Davies, in reply to Dr. Bain, said that coronary spasm was the probable cause of angina. It was doubtless the same lesion as the cerebral angiospastic attacks which caused transient hemiplegia. Alterations in cardiac rhythm were certainly due to thrombosis of the artery to the A.V. bundle.

Dr. Bedford said that it was dangerous to give a prognosis merely from the study of an electrocardiogram. An inverted T-wave could not be said to be of grave import, because it frequently became altered later. He considered low voltage the most serious sign. It was very difficult to obtain postmortems on cases that had been followed electrographically and therefore there was no large series of such cases. In many of his cases, however, the diagnosis had been so confirmed.

Conclusion.

The President summed up the symptoms of coronary thrombosis and described the appearance of the heart in experimental lesions. With regard to prognosis, he agreed with several speakers who had said that the condition was not necessarily a very grave one where there was recovery from the initial attack. In giving a prognosis they had to consider the state of the coronary arteries. A review of the history and the condition of the patient after the event would help in this.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

At its first session, under the chairmanship of Mr. T. Watts Eden, a discussion on the prevention and treatment of

Unsuccessful Forceps Cases

was opened by Dr. Douglas Miller (Edinburgh), who analysed a group of 558 cases delivered in Manchester, Glasgow, and Edinburgh. In 211, of whom 139 were primigravidæ, the underlying cause of dystocia was *disproportion*, due for the most part to pelvic contraction, and in a few to an abnormally large child. The flat rachitic type of pelvis was exceptionally common in Glasgow. In 14 deformity of the outlet and in 6 a contraction ring provided an additional obstacle. Disproportion varied widely in degree; sometimes it had been difficult to remove the head even when crushed, sometimes labour would have been normal if forceps had been withheld. In 161 patients the cause of difficulty had been a *posterior position of the occiput*, for the most part unrecognised. This fact emphasised the urgent necessity of accurate orientation of the head, for which purpose the ear was a more reliable guide than sutures or fontanelles. In most of these occipito-posterior cases the head had been deeply engaged, with the occiput either in the hollow of the sacrum or still obliquely posterior. In the large number, however, in which the head was still high or movable at the pelvic brim, the soft parts had been severely bruised and lacerated by slipping forceps. In several cases the cervix had been only partially dilated, and was badly torn; sometimes the tear involved the lower uterine segment.

In a third group of 151 cases *no abnormality* had been present. Some of these might have been occipito-posterior before their transit to hospital, but in a large number anxiety to relieve suffering had obviously made the practitioner apply forceps before dilatation and head-moulding had sufficiently advanced. The fourth group consisted of 12 face cases.

Treatment.

Where disproportion was the cause, treatment depended on its degree, the condition of the child, and whether an adequate test of labour had been made; 78 patients of the 211 had been delivered spontaneously or by low forceps. Craniotomy had been employed in 98 cases and Cæsarean section only in 12; 21 of the 29 maternal deaths had been due to puerperal sepsis. Of the 161 cases due to occipito-posterior position the majority were advanced in the second stage with the head arrested on the pelvic floor, and an attempt had usually been made to rotate manually and complete delivery with forceps. When impaction had prevented rotation, craniotomy had usually been performed. In two-thirds of the instances in which the head had been arrested at the inlet of the pelvis, or the upper part of the cavity, manual rotation of the head had been combined with external rotation of the body. Where the os had been found fully dilated, forceps had been immediately put on and delivery completed; when the cervix had not been completely effaced, labour had been allowed to proceed. Internal version, performed as a last resort in 11 of these cases, had saved three of the children.

In most of the 151 cases in which *premature* application had been the only cause of failure, the patient had been placed under *morphine* or twilight sleep and delivered spontaneously or by low forceps. When the child had been dead or dying, craniotomy had been performed.

The *total maternal mortality* had been 54, or 10 per cent.; of these the cause had been sepsis in 37, uterine rupture 8, post-partum hæmorrhage and shock 6, and pneumonia 3. In 132, or 23·6 per cent., the puerperium had been morbid by the B.M.A. standard; 357 children, or 64 per cent., had been lost. Many of the patients had only left hospital after exhausting weeks of fever, and many had had to undergo further weeks or months of ill-health from laceration of the cervix, vagina, or pelvic floor. End-results in 98 patients who had been followed up had been 24 complete recoveries and 74 residual disabilities of varying degree, the most frequent being laceration of the cervix, usually due to application of forceps before dilatation. Backward displacement of the uterus, usually associated with subinvolution, downward displacement, and pelvic infection was common. Pelvic infection occurred in one-third of the cases; 24 patients had had to undergo operation for their resulting disabilities.

Unsuccessful forceps cases resulted largely from the breach of three rules: forceps should never be applied greater among cotton operatives than among the general population at all age-periods. The tuberculosis death-rate shows very little change. Only a very small proportion of the contacts avail themselves of the facilities afforded by the tuberculosis dispensary. It is not practicable with the present staff to arrange for home examination of contacts, but the coöperation of private practitioners would be very valuable in this branch of work. There is great need for adequate after-care for cases of pulmonary tuberculosis.

The antenatal clinic was attended by 480 prospective mothers, the total births being 1702. Dr. Holden is disappointed with the number of patients sent to the clinic by the midwives, who attended 82·4 per cent. of the confinements during 1927. He further points out that no improvement has been brought about by the recent requirement of the C.M.B. that practising midwives should carry out antenatal work or (if they feel unable to do so) send their patients to the antenatal clinic. In 1925 7·5 per cent. of the cases attending the clinic were sent by midwives, in 1926 12·3 per cent., and in 1927 12 per cent. The maternal mortality is high, the figures for the last six years being 6·8, 6·7, 5·0, 5·7, 8·0, and 7·6. The stillbirth-rate for 1927 was 5 per cent. The Springfield Maternity Home has accommodation for 20 cases and is recognised as a training hospital for pupil midwives. The medical officer of health has power to remit the minimum fee of 1½ guineas per week in cases of proved necessity, and there is no reason why any mother, whose home surroundings are unsatisfactory, should not avail herself of the facilities and comforts of the home. Nevertheless the home is not used as much as it might be. There were only 220 cases admitted during 1927, of whom six were for antenatal supervision. From 400 to 500 cases could be readily accommodated.

The death-rate from respiratory diseases among the pre-school children was especially high owing to outbreaks of measles and influenza during the first quarter. Although there has been a distinct fall in the infant mortality-rate since 1920, the death-rate in the 1–5 years group shows no such tendency. Blackburn is more fortunate than most industrial towns in its housing conditions. There is no real slum property and no universal overcrowding, the average rooms per person being 1·1. And yet there is a long list of applications for corporation houses, occasional overcrowding caused by subletting, and a growing tendency for tent sheds and caravans to be used as substitutes for houses.

Bolton.

Dr. C. W. Paget Moffatt reports that for the first time since 1922 the Registrar-General has estimated an increase in the population of Bolton, which makes it nearly as high as it was in 1909—viz., 178,667. The scheme for the substitution of water-closets for privy middens has slowed down owing to difficulties as to sewers and prospective demolition of property.

Bolton is coöperating with the Manchester regional smoke-abatement committee. The intention is to have the same by-laws in all the areas of the region, but up to now the regional committee has not been able to formulate by-laws acceptable to the Ministry. There are 226 factory chimneys in Bolton, and Dr. Moffatt thinks there will be no real abatement of the smoke nuisance in industrial areas until soft coal is replaced by smokeless fuel, and that a great deal will be accomplished in this direction before long. By-laws are needed for houses let in lodgings. Strenuous efforts are being made to reduce the nuisance from vans. At the close of 1927 there were 42 living vans as compared with 73 at the close of 1926. Most of the slaughtering in Bolton is done in private slaughter-houses owing to the fact that the public abattoirs are too small and out of date. The new houses erected were 510 municipal, 490 subsidised houses by other persons, and 81 unsubsidised, a total of 1081. Overcrowding is not prevalent and the number of inhabitants per house has decreased steadily from 4·64 at the census of 1901 to 3·86 in 1927. Forty-seven houses were demolished during the year.

The meat regulations have brought about a marked improvement in the handling of meat, but attention is drawn to the very insanitary practice of leaving the feet on the dressed carcasses of lamb and mutton. The frequently filthy condition of the feet is liable to cause dangerous contamination of the meat.

About three-fifths of Bolton's milk comes from 2700 cows stalled in the borough; one-fifth from outside farms is pasteurised by the Coöperative Society; and the remaining fifth comes from other outside farms. The "inside" cows are regularly inspected by the veterinary surgeon, who is usually accompanied by a sanitary inspector to look after the hygienic condition of the dairy farm. As the result of routine veterinary inspection, 6 cows giving tuberculous milk were found and slaughtered. The cows slaughtered under the Tuberculosis Order numbered 32, of which 9 had tuberculosis of the udder, 1 was giving tuberculous milk and had other tuberculous lesions, 6 showed tuberculous emaciation, and 16 had chronic cough and definite signs. One farmer was fined £5 for failing to notify a cow suffering from tuberculosis of the udder.

Dr. Moffatt shows that Bolton is doing everything recommended by the Ministry for the prevention of maternal deaths, but expresses his opinion that a real improvement in the training and status of midwives is needed. A longer and more thorough training would help to exclude from the profession those who adopt it, not as their real life's work, but as a means of adding to the family income.

Bury.

Dr. G. Granville Buckley says that the scheme for the conversion of privies into water-closets has made rapid progress, but that there are about 450 which cannot be dealt with as there is no sewer available. The sewage disposal works have three systems following the sedimentation tanks—namely, single-contact beds, percolating beds, and the activated sludge process. During 1927 six samples of the joint effluent were satisfactory and two slightly unsatisfactory, as judged by the inspectors of the Mersey and Irwell Joint Committee. The public abattoir is modern in every respect. Of the carcasses, bulls were affected with tuberculosis to the extent of 2·5 per cent.; oxen, 0·21 per cent.; cows, 10·25 per cent.; heifers, 0·55 per cent.; and pigs, 4·22 per cent. The infant deaths numbered 62, and there were 34 deaths of children between the ages of 1–5. Of the three deaths making up the maternal mortality one was due to puerperal fever, another to "septic abortion followed by peritonitis and septicæmia set up by douching in an attempt to procure abortion," and the third to "septic abortion following on accidental abortion. Peritonitis (general)." There was a fourth maternal death of a woman, who had attended the antenatal clinic and who developed kidney trouble the tenth day after labour.

Eccles.

Dr. J. E. Spence points out that there were no deaths of children aged 1 to 2 years from gastro-enteritis in 1927, but that 13·3 per cent. of the deaths at this age-period since 1914 have been due to this cause. The fall in mortality at the age-period 2 to 5 has not been regular, but shows fluctuations caused by the respiratory diseases. Since 1914 28·1 per cent. of the deaths in this age-group have been due to bronchitis and pneumonia, 15·9 per cent. to measles, and 8·4 per cent. to whooping-cough. The child welfare work and school medical work is closely coördinated. Each health nurse attends the centre on one afternoon a week and, as far as possible, the mothers in her area come on that afternoon. Each child during its first year is seen by the nurse on ances of encephalitis lethargica and post-vaccinal encephalitis, together with the fact that lesions comparable with those found in natural disease can be reproduced experimentally in animals by the inoculation of virus containing material, is strong evidence that the encephalitis is actually produced by the infecting virus in each of these two conditions.

Dr. J. G. **GREENFIELD**'s paper was read in his absence by Prof. **HADFIELD**. He dealt with encephalomyelitis in measles and pointed out that this complication appeared to be increasing in recent years. He described in some detail the post-mortem findings in a girl of 9 years in whom there developed convulsions, high temperature, and coma four days after the measles rash had appeared. The similarity of the findings to those in post-vaccinal encephalitis were demonstrated.

Dr. S. P. **BEDSON** considered some aspects of the experimental side of the problem. He pointed out that the virus of herpes febrilis should be carefully considered in dealing with nervous manifestations in virus diseases. This virus has been considered by some authorities to be the causal factor in encephalitis lethargica, such view being based on the isolation of the virus of herpes febrilis from such cases. In encephalitis lethargica, however, no skin lesions occur. Dr. Bedson claimed that an antibody is developed in herpes infection, but he could find no such antibody in encephalitis lethargica. The herpes virus is highly neurotoxic in rabbits, and further, spontaneous encephalitis also occurs in these animals. Great care is therefore necessary in interpreting results.

Prof. G. **HADFIELD** (London) described the appearances in a case of post-vaccinal encephalitis. He had also studied in detail the nervous system of four children who had died from accidental causes shortly after vaccination. In these cases no changes were found. The histological picture in the encephalitis case corresponds with that of other workers. The importance of investigating the condition and reaction of the neuroglia was emphasised. The histological picture in post-vaccinal encephalitis seems to be standard but not specific because of similarity in measles and small-pox. In early lesions of disseminated sclerosis there is histological similarity to the above lesions, but the clinical features suggest a different ætiology.

Prof. J. H. **DIBLE** (Cardiff) expressed considerable doubt on the interpretations of experimental work in encephalitis lethargica. He said that in the rabbit the positive results obtained were inextricably mixed up with the herpetic virus. If herpes and encephalitis virus are the same thing then it exhibits different properties in human and rabbit brains. It is impossible to produce keratitis with fresh material from encephalitis cases, but when encephalitis has been produced in rabbits the virus recovered from the brain will produce keratitis. Clinically, encephalitis rarely or never presents herpes. Herpes is common in pneumonia, but cerebral affection is absent or rare in this condition. Prof. Dible, Flexner, and others had failed to infect rabbits with encephalitis lethargica. Flexner had also failed to infect monkeys. Those who have produced apparently positive results show marked disparity in the time of incidence, and it is difficult to believe that one and the same virus could exhibit such eccentricities. The speaker expressed doubt that the condition of encephalitis lethargica has ever been transmitted to animals.

Prof. J. **CRUICKSHANK** (Aberdeen) drew attention to the incidence of herpes infection in bacterial diseases, and sought information on the incidence of encephalitis in such cases. He further described an interesting happening in which a stock of calf lymph which was used without ill-effects in Spain, when used in Holland produced a number of cases of post-vaccinal encephalitis. Was this the result of a dormant virus being stimulated?

Prof. **McINTOSH**, in reply, said he was quite satisfied that the lesions he had obtained were not those of herpes febrilis or spontaneous encephalitis.

The **PRESIDENT** summed up the discussion which, he said, had brought out clearly the fact that a form of encephalitis was definitely associated with vaccination. Whether the vaccine was the actual cause of the encephalitis or whether it served merely to light up an already existing latent infection was not important from the practical standpoint. If one man assaulted another with a fatal result, the fact that the victim might not have died had he not suffered from heart disease would not save the assailant from punishment. Similarly, vaccination could not be held blameless even if it only lighted up a latent infection. The existence of cases of encephalitis following vaccination was now established, but official figures as to the proportion these cases bore to the total number of vaccinations performed were not available. Since allusions to the complication had frequently appeared in the lay press, he had hoped that the discussion would have brought out some information on this point, so that the medical profession would be in a position to reassure the public.

An interesting exhibition of pathological specimens was on view at University College throughout the Association's meeting.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some 1927 statistics of five Lancashire districts :—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Blackburn C.B. (124,500)	13·7	14·9	0·88	1·28	4·0	2·2	77/37	7·0	7·6
Bolton C.B. .. (178,300)	15·1	13·8	1·04	1·32	3·2	1·9	75/36	7·4	4·4
Bury C.B. .. (56,770)	13·7	14·3	1·02	1·35	3·8	2·3	79/35	5·1	3·8
Eccles B. . .. (45,390)	15·6	12·7	1·06	1·65	2·3	2·2	61/24	4·2	2·8
Swinton and Pendlebury U.D. .. .. (34,750)	12·2	10·0	0·86	1·14	2·0	1·4	75/40	2·3	4·7

C.B. = County Borough. B. = Borough.
U.D. = Urban District.

Blackburn.

Dr. Oscar M. Holden reports a sunless year with an abnormal rainfall—958 hours of bright sunshine recorded at the corporation hospital as compared with 1114 in 1926, and 43·3 in. of rain as compared with 40·9 in. Dr. Holden thinks the extent of the clay drifts has some bearing on the prevalence of the rheumatic affections, which are a prominent feature in the sickness records. The year was one of depressed industrial conditions with much unemployment in the town's chief industry of cotton weaving and its subsidiary branches. The population of Blackburn reached its zenith in 1914, and in 1927, for the first time since the war, the deaths exceeded the births—namely, by 162.

The respiratory group of diseases bulks most largely in the death returns of the town, and the predominant causes suggested are unfavourable climatic conditions coupled with a dirty atmosphere. Deaths due to respiratory diseases are markedly greater among cotton operatives than among the general population at all age-periods. The tuberculosis death-rate shows very little change. Only a very small proportion of the contacts avail themselves of the facilities afforded by the tuberculosis dispensary. It is not practicable with the present staff to arrange for home examination of contacts, but the coöperation of private practitioners would be very valuable in this branch of work. There is great need for adequate after-care for cases of pulmonary tuberculosis.

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The death-rate from respiratory diseases among the pre-school children was especially high owing to outbreaks of measles and influenza during the first quarter. Although there has been a distinct fall in the infant mortality-rate since 1920, the death-rate in the 1–5 years group shows no such tendency. Blackburn is more fortunate than most industrial towns in its housing conditions. There is no real slum property and no universal overcrowding, the average rooms per person being 1·1. And yet there is a long list of applications for corporation houses, occasional overcrowding caused by subletting, and a growing tendency for tent sheds and caravans to be used as substitutes for houses.

Bolton.

Dr. C. W. Paget Moffatt reports that for the first time since 1922 the Registrar-General has estimated an increase in the population of Bolton, which makes it nearly as high as it was in 1909—viz., 178,667. The scheme for the substitution of water-closets for privy middens has slowed down owing to difficulties as to sewers and prospective demolition of property.

Bolton is coöperating with the Manchester regional smoke-abatement committee. The intention is to have the same by-laws in all the areas of the region, but up to now the regional committee has not been able to formulate by-laws acceptable to the Ministry. There are 226 factory chimneys in Bolton, and Dr. Moffatt thinks there will be no real abatement of the smoke nuisance in industrial areas until soft coal is replaced by smokeless fuel, and that a great deal will be accomplished in this direction before long. By-laws are needed for houses let in lodgings. Strenuous efforts are being made to reduce the nuisance from vans. At the close of 1927 there were 42 living vans as compared with 73 at the close of 1926. Most of the slaughtering in Bolton is done in private slaughter-houses owing to the fact that the public abattoirs are too small and out of date. The new houses erected were 510 municipal, 490 subsidised houses by other persons, and 81 unsubsidised, a total of 1081. Overcrowding is not prevalent and the number of inhabitants per house has decreased steadily from 4·64 at the census of 1901 to 3·86 in 1927. Forty-seven houses were demolished during the year.

The meat regulations have brought about a marked improvement in the handling of meat, but attention is drawn to the very insanitary practice of leaving the feet on the dressed carcasses of lamb and mutton. The frequently filthy condition of the feet is liable to cause dangerous contamination of the meat.

About three-fifths of Bolton's milk comes from 2700 cows stalled in the borough; one-fifth from outside farms is pasteurised by the Coöperative Society; and the remaining fifth comes from other outside farms. The "inside" cows are regularly inspected by the veterinary surgeon, who is usually accompanied by a sanitary inspector to look after the hygienic condition of the dairy farm. As the result of routine veterinary inspection, 6 cows giving tuberculous milk were found and slaughtered. The cows slaughtered under the *Tuberculosis Order* numbered 32, of which 9 had tuberculosis of the udder, 1 was giving tuberculous milk and had other tuberculous lesions, 6 showed tuberculous emaciation, and 16 had chronic cough and definite signs. One farmer was fined £5 for failing to notify a cow suffering from tuberculosis of the udder.

Dr. Moffatt shows that Bolton is doing everything recommended by the Ministry for the prevention of maternal deaths, but expresses his opinion that a real improvement in the training and status of midwives is needed. A longer and more thorough training would help to exclude from the profession those who adopt it, not as their real life's work, but as a means of adding to the family income.

Bury.

Dr. G. Granville Buckley says that the scheme for the conversion of privies into water-closets has made rapid progress, but that there are about 450 which cannot be dealt with as there is no sewer available. The sewage disposal works have three systems following the sedimentation tanks—namely, single-contact beds, percolating beds, and the activated sludge process. During 1927 six samples of the joint effluent were satisfactory and two slightly unsatisfactory, as judged by the inspectors of the Mersey and Irwell Joint Committee. The public abattoir is modern in every respect. Of the carcasses, bulls were affected with tuberculosis to the extent of 2·5 per cent.; oxen, 0·21 per cent.; cows, 10·25 per cent.; heifers, 0·55 per cent.; and pigs, 4·22 per cent. The infant deaths numbered 62, and there were 34 deaths of children between the ages of 1–5. Of the three deaths making up the maternal mortality one was due to puerperal fever, another to "septic abortion followed by peritonitis and septicæmia set up by douching in an attempt to procure abortion," and the third to "septic abortion following on accidental abortion. Peritonitis (general)." There was a fourth maternal death of a woman, who had attended the antenatal clinic and who developed kidney trouble the tenth day after labour.

Eccles.

Dr. J. E. Spence points out that there were no deaths of children aged 1 to 2 years from gastro-enteritis in 1927, but that 13·3 per cent. of the deaths at this age-period since 1914 have been due to this cause. The fall in mortality at the age-period 2 to 5 has not been regular, but shows fluctuations caused by the respiratory diseases. Since 1914 28·1 per cent. of the deaths in this age-group have been due to bronchitis and pneumonia, 15·9 per cent. to measles, and 8·4 per cent. to whooping-cough. The child welfare work and school medical work is closely coördinated. Each health nurse attends the centre on one afternoon a week and, as far as possible, the mothers in her area come on that afternoon. Each child during its first year is seen by the nurse on an average 29 times, during the second year 8·9 times, and during the third year 4·8 times. The supervision continues during the 3–5 age-period, when about half the children attend school. Early treatment of the pre-school child for squint, dental trouble, and other ailments is thus made possible. "Ultra-violet" treatment is provided at Barton-upon-Irwell Hospital for rickets and debilitating conditions, but Dr. Spence is not greatly impressed with its value, if separated from other hygienic measures. There is a difficulty in getting the "lazy, indolent mother" to persevere with any treatment for rickets, as she trusts to the deformities disappearing without treatment and does not appreciate that the deformity is only one effect of the disease. The water from the two swimming baths is filtered through Bell's filters. The men's bath was closed for repairs after the water had been in use from January, 1923, until Oct. 31st, 1927. During the whole of this period the chemical and bacteriological examination of this water was satisfactory. The women's bath is chlorinated as well as filtered, but the analysis taken on Sept. 20th shows more chlorine in the water of the men's bath than in that of the women's. Notwithstanding the extensive provision of municipal houses, there are too many houses occupied by more than one family, and many cases of hardship therefrom. The rent charged to the lodging family in many instances exceeds the rent of the whole house. During the year 19 municipal houses, 34 subsidiary houses, and 3 houses of a larger type were erected, while 24 houses were demolished. Ninety municipal houses are nearing completion, and the corporation are considering a scheme for 68 more. There are 800 families which still require to be housed and there are no signs of the shortage of houses being overtaken.

Swinton and Pendlebury.

Dr. H. C. Mulholland, who is also school medical officer and certifying factory surgeon to the urban district, says the staff engaged upon orthopædic, dental, and aural work for the schools does similar work for the maternity and child-welfare centres. The district, except in a few outlying cases, is on the water-carriage system. The sanitary inspectors have been sent for a course of special training in dairying. A table shows that out of 52 routine samples of mixed milk, tested by biological methods, nine contained tubercle bacilli. Systematic veterinary inspection of the farms has been in force since 1924, and the veterinary surgeon is accompanied by the sanitary inspector, who sees to the sanitary condition of the dairy farms. The council has adopted the limit of 2 minutes in the half hour for black smoke, and legal proceedings were successfully taken and fines inflicted during the year in three instances. Since 1920, 32 cases of encephalitis lethargica have been notified, including one doubtful case in 1927. The present condition is that 8 have died, 17 are severely ill, 4 are slightly ill and fit for light work, and 3 are apparently normal. There was no evidence that case-to-case infection, insanitation, or overcrowding were causal factors. The health visitors have undergone a short course of training at the Manchester Royal Eye Hospital on the nursing of ophthalmia neonatorum. The four cases notified in 1927 all made a complete recovery. One urinary typhoid carrier resident in the district is kept under observation, but did not give rise to any cases in 1927. There were 709 births, and 81 expectant mothers attended the antenatal clinic, which is conducted by a consultant. Caravans tend to increase in the district, and the occupants are usually dependent upon neighbours for water and sanitary conveniences. There are just over 5000 working-class houses in the district, and 309 of these houses are overcrowded. Houses needed are estimated at 510, 210 for the unsatisfied demand, and 300 to provide for the demolition of insanitary property. No council houses were completed during the year, but 182 are in course of erection.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 21ST, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 173 (last week 177); scarlet fever, 1528; diphtheria, 900; enteric fever, 54; pneumonia, 706; puerperal fever, 43; puerperal pyrexia, 94; cerebro-spinal fever, 7; acute poliomyelitis, 5; acute polio-encephalitis, 4; encephalitis lethargica, 21; dysentery, 3; ophthalmia neonatorum, 130. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified from the following 19 counties:—London, 9; Buckingham, 1; Derby, 12; Durham, 53; Essex, 3; Huntingdon, 1; Kent, 1; Lancaster, 5; Northampton, 1; Northumberland, 12; Nottingham, 2; Soke of Peterborough, 2; Stafford, 11; Surrey, 1; Yorks East Riding, 3; North Riding, 12; West Riding, 24; Glamorgan, 13; Monmouth, 7.

The number of patients in the Infectious Hospitals of the *Metropolitan Asylums Board on July 24th–25th was* as follows:—Small-pox, 23 under treatment; scarlet fever, 1771; diphtheria, 1849; enteric fever, 19; measles, 303; whooping-cough, 196; puerperal fever, 18 (plus 12 babies); encephalitis lethargica, 67; poliomyelitis, 2; "other diseases," 22. At St. Margaret's Hospital there were 21 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 5 (1) from enteric fever, 28 (5) from measles, 5 (3) from scarlet fever, 20 (1) from whooping-cough, 26 (8) from diphtheria, 36 (9) from diarrhœa and enteritis under two years, and 21 (2) from influenza. The *figures in parentheses are those for London* itself.

The four fatal cases of enteric fever outside London were reported from Southampton, Sunderland, and Newcastle-on-Tyne (2). Of the 23 fatal cases of measles outside London, 6 were reported from Liverpool. Of the 19 cases of whooping-cough outside London, 3 were reported from Birmingham. In the same week Glasgow reported 6 and Belfast 4. Belfast also had 6 fatal cases of measles. The deaths from *diarrhœa are still diminishing.*

The number of stillbirths registered during the week was 270 in the great towns (corresponding to a rate of 38 per 1000 births), including 53 in London.

Deaths from Small-pox.—A supplementary monthly statement shows that the returns for the month of June included, in addition to the deaths already shown in the Weekly Return, 6 deaths certified as due to small-pox either as principal or contributory cause. These deaths were assigned to the following areas:—Ilfracombe U.D., 1; King's Lynn M.B., 2; Thame U.D., 1; Keighley R.D., 1; and Gelligaer U.D. (Glam.), 1.

HERTFORD BRITISH HOSPITAL, PARIS.—The King and Queen have given their patronage to this hospital, which was founded during the seige of Paris in 1871 by the late Sir Richard Wallace. In 1879 Sir Richard erected a new building which his widow handed over to the British Government. The British Ambassador in Paris for the time being is the honorary president. The hospital is situated at Levallois-Perret, outside the fortifications, and has 46 beds.

EXTENSION OF LEEDS GENERAL INFIRMARY.—Particulars are now available of the proposed large extensions of this institution which, together with the discharge of the bank overdraft, will cost £250,000. There is to be a paying patients' block of three floors in which patients will pay some 5 to 7 guineas a week, according to the degree of privacy enjoyed. It is hoped that this block will help to remove the difficulties caused by the rapid growth of motor accident cases which are costing the infirmary £1000 a year, while the donations traceable to those concerned amount to less than £100. Another block, which is to be built first, will provide for another 100 non-paying patients—the waiting-list has rarely less than 1000 names. The building of these two new blocks will increase the total accommodation of the infirmary itself and the branches at Cookridge from 632 to 800 beds. The present average annual deficit is £25,000 and the extensions will increase the cost of maintenance from £104,000 to £120,000 a year.

Special Articles.

MEDICINE AND THE LAW.

Death Certification: Date of Certifying Practitioner's Last Visit.

THE primary purpose of the coroner's inquest is one of public safety—the detection of foul play, and consequently the prevention of crime. The result of the amending legislation of 1926 was to interlock the law relating to coroners and the law relating to the certification of death. It now is, or should be, as difficult as human foresight can make it to conceal a death or to dispose of a body without adequate official knowledge of the circumstances of the death. It also is, or should be, as difficult as human foresight can make it to dispose of a body by burial or cremation when death has not in fact taken place. These safeguards for the public have naturally not been evolved without enacting an elaborate code of statutes and regulations. There is some reason to think that medical practitioners, on whose coöperation the whole system depends, are not yet fully aware of the new legal position. The Registration Act of 1926 provided for a "prescribed" form of doctor's death certificate, and the form thus prescribed requires the doctor to state when he last saw the patient alive. Part IX. of the new regulations—the Registration (Births, Stillbirths, Deaths and Marriages) Consolidated Regulations of 1927—is headed, "References to Coroner and Registration after Reference—Stillbirths and Deaths." One of the occasions on which the registrar must report to the coroner before registering a death is where "it appears to the registrar from the particulars contained in the medical certificate or otherwise that the deceased was seen by the certifying medical practitioner neither after death nor within 14 days of death." Those who are apprehensive of the risk of a person being buried alive will reckon this regulation as intended to avert that danger as well as to lessen the chance that death might be caused by violence or poisoning in the interval between the practitioner's last visit and the date of death.

At a recent inquest, held in Southwark by Dr. F. J. Waldo upon the death of a woman aged 81, the coroner explained that the case had been reported to him by the registrar under the regulation already cited. It appeared that the medical practitioner had certified death to be due to natural causes, and that his last attendance had been seven weeks before the date of death. In these circumstances the coroner ordered a full post-mortem examination by an independent pathologist, and requested the attendance of the certifying doctor at the inquest. The pathologist's evidence agreed with the certificate, and thus the inquest merely confirmed what was already upon record. In answer to the coroner the pathologist agreed that, without careful expert examination of a body, it was not safe to assume that death had actually taken place. He cited an instance where the police had recently called him in to examine a youth in a state of catalepsy. The patient appeared dead but, on examination, a feeble pulse beat was found in spite of commencing rigor of the muscles of the jaw, absence of eye reflex, and dilated pupils—three characteristic signs of death; appropriate treatment ended in recovery. Dr. Waldo, in summing up, described the state of the law in connexion with death certification, registration, and disposal of the dead as unsatisfactory and dangerous. It was, he said, of vital importance to the public that the view and external examination of the body by the certifying doctor should be made compulsory before burial. Such a course would be a safeguard against any possible false assumption of death. Dr. Waldo's point is that a statutory period of 14 days, without any further view of the body, is neither a safeguard against premature burial nor a trustworthy precaution against the non-detection of foul play. He would have the present law amended in the following three respects: first, compulsory view of the body by the certifying practitioner who attended the deceased (with payment of a small fee for such duty) prior to registration of death by the local registrar; secondly, registration without report to the coroner, provided the certifying doctor had last attended his patient within 14 days of death and had also viewed the dead body; thirdly, statutory notification by the registrar to the coroner of all deaths of patients not seen by the certifying doctor within the 14 days period, to be followed by public inquest.

It is probably a surprise to some practitioners to find that coroners can, and do, order *post-mortem* examination and inquest where the certifying doctor has not seen the deceased within 14 days of death. Each case must be judged upon its own set of facts, and it may well be that one coroner would not take the same view of his responsibilities as another. Whether the law will soon be changed is doubtful. Parliament has only lately hammered out the new changes, and the arguments for different changes were fully discussed when the present ones were adopted. Sir Kingsley Wood, replying to a question by Mr. T. E. Naylor, M.P. for Southwark, in the House of Commons on July 11th, held out no prospect of further legislation at present.

A Point in the Coroner's Law.

A coroner asks a practitioner for certain information as to the cause of death of a deceased person to enable him to decide whether or not he will hold an inquest. The information desired in this case was technical both as to fact and opinion, and was given out of professional knowledge and experience. On consideration of the information the coroner decided to hold no inquest, and having held no inquest he paid no fee. Quite amicably, the doctor and the coroner have sought our opinion, or reference to any opinion that has been previously expressed in similar circumstances. The doctor considers that a fee is due to him, and the coroner, allowing the justice of the claim, replies that he has no power under the law to satisfy it.

It seems to us clear that the doctor should be paid, and equally clear that the coroner should not be at the expense of a fee for which he would be surcharged. A sentence in the Statute would suffice to meet the case, but changes in an Act of Parliament are not readily brought about; and while the situation may occur with sufficient frequency to suggest a demand for legislation, it is not clear to us that the existing position is not preferable. The doctor who supplies the coroner with the needful information is relieved of a responsibility to give medical evidence, and many practitioners would welcome this, while the relatives are spared a procedure that they always dislike unless they have reason for promoting an inquiry. In all such cases the coroner would know the feeling of the family and would hold the inquest. One natural source for the fee would be estate of the deceased, if there were any estate, but executors could not be bound to admit the doctor's claim.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Settlement of a Conflict Between the Profession and a Sick Club.

WITHIN the last few weeks a serious conflict arose between the entire medical profession in Vienna and the vast organisation called the Sickness Insurance Club for Civil Servants. This latter has about 280,000 members, and had hitherto offered free choice of practitioners to its members. Recently the administrative body of this club has tried to remove the bulk of the profession from the free choice list; doubtless the intention was gradually to substitute for the free choice system—advantageous both to the profession and the patients, but not to the administrative body—a system of appointed doctors responsible only to the board of the club. As the remonstrances of the medical representatives were useless, from June 11th all medical work for the club was refused, and the members were received only as private patients. They were, however, entitled to demand compensation and a refund of the fees paid to the sick club. This led to troublesome conditions for all parties concerned, but mostly for the managing board, so that after some three weeks it was found more convenient to arrive at an understanding. The arrangement provides that in future the board of the club will not seek to introduce innovations of any kind pertaining to therapy without the consent of the medical representatives; the extent of specialist service to be available will be controlled by a board chosen equally by the club and the profession. Some minor problems were settled at the same time, in a sense favourable to the practitioners, so that this strike—the first instance of a medical fight on the lines of trades-unionism in this country—can be looked upon as having ended in favour of the doctors.

Decapsulation of the Testicle as a Means of Rejuvenation.

Intense public interest seems to be aroused by any suggested methods of regaining lost youthfulness. Prof. Ullmann (Vienna) has now published his observations on the method of "decapsulation," practised by him since 1915, but hitherto unpublished. He has had the opportunity of making transplantations of testicles in cases of ectopia testis, and of examining such cases after a few years. In each case new blood-vessels had formed, but only if the transplantation took place in individuals belonging to the same blood group or a related one. Otherwise the transplanted organ was gradually absorbed. This he holds to be the fate of the testicles transplanted from monkeys or other animals (Voronoff). In such cases transplantation acts only as a stimulus, like a non-specific protein injection. Ullmann claims now that the safest and most reliable method of producing lasting hyperæmia—and thus a hyperproduction of the hormones—in the testis is to decapsulate it and thus offer it means to expand, since the primary reason for diminished function of the testes is, according to him, the increasing intra-testicular pressure with lessened blood-supply, due to sclerotic processes. Prof. Ullmann lays stress on the fact that, in 1915, when the problem of blood-group relation was unknown, transplantation was applied in a wrong way, and that now his method, which is very simple, should be tried in suitable cases.

Resignation of Prof. Wagner-Jauregg.

The well-known neuro-pathologist and latest recipient of the Nobel prize for medicine, Prof. Wagner-Jauregg, has resigned his post as chief of the clinic for neurology and psychiatry in Vienna, having attained the age of 71. His farewell lecture, held a few days ago, was marked by a number of farewell speeches from his pupils. The professor himself completed his task by delivering a splendid lecture on the treatment of tabes, after which Prof. Redlich and Dr. Poetzl, on behalf of the former and the present pupils, spoke of the importance of his contributions to the advance of neurology, notably in the prophylaxis of thyroid enlargement and the malarial treatment of general paralysis of the insane and tabes dorsalis. The office of Wagner-Jauregg will be filled shortly either by Prof. Economo (Vienna), well known for his researches on encephalitis lethargica, or by Prof. Poetzl (Prague), the first-named being regarded as the more likely candidate.

Statistics Concerning Suicides in the Half Year 1928.

The public records for the first half of 1928 show that 1528 persons attempted to commit suicide in Vienna, of whom 507 attained their object. These figures show a marked and constant increase in comparison with the years before the war and the period immediately following it, the number of attempts being double those recorded in 1917. It is remarkable that while the same number of men and women tried to kill themselves, only 199 women succeeded in doing so, against 308 men. As regards the causes of suicide, 287 (106 of these were men) tried to destroy their lives for family troubles; 275 (165 men) because of poverty, 160 (80 men) for incurable illness, 160 (55 men) an account of love affairs, 130 persons (78 men) were insane; 41 men and 5 women despaired of their financial position or outlook, 17 men and 22 women were prompted by a severe family loss. In 433 cases (221 men) the reasons were unknown.

American Post-graduate Students in Vienna.

This summer, as usual, a large number of American doctors have made our university their temporary home. In the last week of June a group of over 60 doctors, under the leadership of Prof. George MacKenzie, of Chicago, have been here, having arranged beforehand to attend a number of special courses in the clinics of Profs. Neumann, Hejek, and Masschik (oto-rhino-laryngology) and Profs. Meller and Lindner (ophthalmology). These classes will last six weeks each, and will occupy ten hours daily, so that each student will obtain 300 hours of instruction. These zealous post-graduate students, in order to fit themselves to make the most of the instruction provided, attended classes conducted by Prof. MacKenzie, as an introduction to oto-rhino-laryngology and ophthalmology. Post-graduate courses in Vienna are much favoured by the Americans; already more than 300 have put down their names for courses in the session 1928–29. A special American Medical Association of Vienna controls and organises these courses, which are held in English.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Venereal Diseases.

IN Dr. William Robertson's report on the health of Edinburgh in 1927 reference is made to venereal diseases and to the House of Common's refusal of a second reading to the Corporation Bill. The report notes that certain forms of disease are on the increase despite all that has been said and done to educate the public. It is unfortunate that moral and social questions have been introduced to hamper us in our efforts to control the spread of these dangerous infections. Venereal diseases are much more serious than other maladies because, if incompletely treated, they may have disastrous after-effects. It was because we are aware of the serious consequences to the individual and to future generations that we desired to secure a better control of the disease in its different forms and phases. We may as well cry for the moon to come down to earth as expect to get the better of venereal diseases by voluntary methods. The great majority of infected persons will continue to present themselves for treatment, but unless we have the power to compel those who are indifferent, careless, or obstinate to rid themselves of the disease we must expect to find a continuation of mental deficiency, affections of the nervous system, miscarriages, as well as chronic and often indefinable ill-health among men, women, and children. Our effort has been arrested by dialectics. Those who have experienced the difficulties and understand the problem from actual contact with it have been seriously discouraged though not disheartened.

The Slaughter of Sheep.

A report on the investigation carried out in Edinburgh on June 14th has now been issued by Dr. Henry Dryerre, Professor of Physiology at the Royal

Dick Veterinary College, and Dr. J. D. S. Cameron, Physician to the Royal Dispensary. They state that 60 sheep were provided, and at their request the suggested methods of slaughter were amended and ordered as follows: (1) sticking and checking, 20 sheep; (2) shooting and sticking, 20 sheep; (3) shooting and sticking, and breaking of the neck, 10 sheep; (4) sticking and checking, 10 sheep. In the determination of when consciousness was lost, they based their conclusions upon the disappearance of certain cerebral reflexes. They give it as their opinion that shooting and sticking is much to be preferred to sticking and checking, from the humanitarian point of view and, further, that after shooting, no humanitarian benefit is derived from checking or neck-breaking. They realise that sticking is necessary from the utilitarian point of view, and no objection can be taken to this procedure, on the grounds that it produces pain, if shooting precedes it.

The Scottish Health League.

A meeting of the provincial council of the Scottish Health League was held recently in Glasgow, with Prof. Carstairs Douglas in the chair. A large and representative General Council was elected, including many well-known members of the medical and dental professions, together with 94 medical officers of health throughout Scotland. Colonel P. S. Lelean, Professor of Public Health in the University of Edinburgh, was elected chairman, and Dr. A. K. Chalmers, vice-chairman of the General Council, with Dr. David McKail hon. secretary. The following Executive Council was elected: Dr. M. Adams McVey, L.D.S., Dr. Thomas Adam, Dr. G. G. Buchanan, Dr. Agnes Cameron, Mr. J. Menzies Campbell, L.D.S., Dr. A. K. Chalmers, Prof. Carstairs Douglas, Dr. R. C. Scott Dow, L.D.S., Dr. James Kerr, Prof. P. S. Lelean, Dr. G. W. McIntosh, Dr. David McKail, Dr. G. V. T. McMichael, Dr. J. Hume Patterson, Dr. D. L. Radford, L.D.S., Dr. G. Y. Richardson, Dr. T. Lauder Thomson, Dr. Margaret Tod, and Dr. Chalmers Watson.

The Council intends to form an advisory council, and health societies and social organisations operating in Scotland have been invited to nominate representatives. It has been decided to inaugurate branches of the League throughout Scotland, and it is hoped that all interested in the dissemination of knowledge upon healthy living will coöperate with the Council.

Larbert Colony Scheme for Adult Mental Defectives.

The directors of the Royal Scottish National Institution, Larbert, are appealing for support towards the colony now being established at Larbert Estate for the whole-life care of adult mental defectives. For the last 65 years the Royal Scottish National Institution has provided a home, care, and training for mentally defective children, of whom there are at present over 500 in the home; but these children have to be discharged on arriving at the age of 16 or 20. The directors emphasise the dangers which this involves both for the mentally defective themselves and the community. The colony scheme has been adopted by every other progressive country, but has not hitherto been attempted in Scotland.

Students' Attitude to Charity.

Edinburgh students have recently been considering a proposal that they should run a "Charities Week" of their own instead of merely helping the organisers of the Royal Infirmary pageant on Infirmary Day. The suggestion, which was discussed by the students' representative council, has not met with general approval. Such efforts are made annually in Glasgow and Aberdeen, and they have hitherto met with great success. In deciding not to follow the example of the students of these two cities, the Edinburgh students were of opinion that the idea of collecting for charity was being carried too far. In Glasgow, for instance, the students started quite modestly. But they always set themselves out to beat their previous total, with the result that the campaign is now gigantic, and they find themselves committed to a big piece of organisation. Necessarily they have only a limited amount of spare time. It is no longer an enjoyable rag, but a serious, arduous campaign, with months of preparation. Again, in Glasgow and Aberdeen the infirmaries do not organise pageants of their own as is done in Edinburgh, and the concerted effort of the students is the only one of the year in these cities.

The students will, of course, continue to do their best on Infirmary Day.

The Trend of Medicine.

The place which the physician has held in the world in the past and the place which he is likely to hold in the future were touched upon by Prof. William Wright Smith, in the course of an address at the summer graduation in medicine at Edinburgh University on July 18th. The trend of medicine, he said, was to the prophylactic. In the plant world it had been realised long ago that cure was at best difficult—prevention was the aim. How would these changes affect them in the public eye? We were still far, perhaps, from the institution of a scientific medical police. But would the tendency be for the medical man to become more and more of an official? Officials were not loved. But as long as the ethical obligations, so characteristic of the past, continued on the same high level, the favourable status of the profession was assured.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. D. G. Addison-Scott is placed on the Retd. List with rank of Surg. Capt.

Surg. Comdr. T. C. Patterson to *President*, for Medical Dept., temp.

ROYAL NAVAL VOLUNTEER RESERVE.

Prob. Surg. Lts. R. Pedlow and W. T. Donovan to be Surg. Lts.

ROYAL ARMY MEDICAL CORPS.

Capts. to be Majs.: C. B. C. Anderson, P. E. D. Pank, and G. Moulston.

ARMY DENTAL CORPS.

Temp. Capt. W. L. Pearson, Dental Surg., Gen. List, to be Capt.

Lt. (on prob.) R. W. Mather is confirmed in his rank.

TERRITORIAL ARMY.

Capt. E. Scott to be Maj.

J. R. Wright and G. C. Vaughan to be Lts.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Army Dental Corps.—Lt. H. G. L. Fletcher, from T. A. Res. of Off. (5th Bn. Foresters), to be Lt.

ROYAL AIR FORCE.

The temp. commn. of Flying Officer S. McC. Craig (temp. Lt., Gen. List, Army Dental Surgeon) is terminated on relinquishment of his Army commission.

RESERVE OF AIR FORCE OFFICERS.

Flight Lt. W. D. Miller is transferred from Class D2 to Class D1.

INDIAN MEDICAL SERVICE.

Capt. D. R. Thomas to be Maj.

Nand Lal Sah and Bhawani Das Sindhwani to be temp. Lts.

The undermentioned retire: Maj.-Gen. A. A. Gibbs and Lt.-Cols. H. Watts and W. Lapsley.

TERRITORIAL DECORATION.

The King has conferred the Territorial Decoration upon Majs. R. I. Dacre, A. Young (ret.), and W. T. Briscoe.

Birmingham Children's Hospital.—The board of governors report that during the first six months of the present year the number of patients admitted was 2798, nearly 250 more than in the same period last year. The waiting-list exceeds 700, and two new wards are to be built to provide 40 more beds, together with an isolation block.

Correspondence.

"Audi alteram partem."

CANCER: VIRUS OR ENZYME?

To the Editor of THE LANCET.

SIR,—After what we have suffered at the hands of too imaginative reporters, it is refreshing to read your admirable leading article under the above title. At no time have we suggested that cancer in general is due to an enzyme. All that Dr. Murphy and I have claimed is that a certain tumour of fowls, commonly known as Rous Sarcoma No. 1, is produced by a chemical substance of enzymic nature and not by a virus in the ordinary acceptation of the word. I am a little surprised at your verdict that "the essential problem presented by the filterable tumour of the fowl is not whether the causative 'agent' is a virus or an enzyme." My memory may be playing a prank on me, but I seem to recollect that just three years ago you wrote in an article which was quoted all over the world, that the conclusions of Gye and Barnard provided "a solution of the central problem of cancer." These conclusions were based entirely on the belief that the same chicken tumour agent was a *virus*. If it is an enzyme, then the whole theory fails.

In the annual report of the British Empire Cancer Campaign, published on July 9th, I mentioned that I had once induced the Rous sarcoma by the injection of minced normal fowl pancreas, but I did not feel inclined to attach undue importance to it, as it was a solitary observation. It was only when my friend, Dr. Murphy, informed me of his more recent and more extensive experiments that I urged him to communicate them briefly to the International Conference on Cancer. When these are published in detail I think they will supply the information you desire.

The demonstration of the enzymic nature of the chicken-tumour agent, as you very well say, "would not in itself solve the problem of malignancy, but would rather present us with a phenomenon of far-reaching significance in its general biological aspects." My recent communication shows that I have realised this, and I can assure you, Sir, that although Dr. Murphy did not discuss it in his paper, he is well aware of the implications.

I am, Sir, yours faithfully,
ARCHIBALD LEITCH.

Cancer Hospital Research Institute, Fulham-road, S.W.,
July 30th, 1928.

"CARDIAC CLINICS."

To the Editor of THE LANCET.

SIR,—I shall be glad to be allowed space to comment on the letter from Dr. W. Robert F. Collis which appears in your last issue (p. 199).

1. I do not think that it should be said that in England we are apt to regard America as free from juvenile rheumatism. On the contrary, American reports and papers have been much studied here and, as their value deserved, widely quoted.

2. It is good to read of Dr. Collis's enthusiasm for special clinics for the study of rheumatic heart disease in children, but we are not, perhaps, as far behind in this matter here as he thinks. Glasgow was the first in the field, but there are now in the metropolitan area of London seven such centres (see *L.C.C. Gazette*, July 16th, 1928); and there are others, probably many others, in the provincial cities and big towns. In most cases such centres are attached to hospitals and are under the direction of one of the physicians on the honorary staff, but two of the seven London ones are under the care of Dr. Dobbie, of the L.C.C. Medical Service. As only 15 months have elapsed since the publication of the second report of the British Medical Association Committee on Rheumatic Heart Disease in Children, in which the establishment of such centres in connexion with hospitals was advocated, I think the response of the voluntary hospitals has been extremely good.

3. I still hold that to call such centres "cardiac clinics for children" is, in spite of the alluring alliteration, the greatest possible mistake. As the B.M.A. Committee considered, unless the word "rheumatism" is included in the title, attempts at the prevention of rheumatic heart disease are bound to be handicapped. What the poor make of the word "cardiac" I do not know, but certain it is that hospital parents, although they may know that their child has rheumatism, hardly ever suspect the presence of heart disease. For this reason most of the clinics have in England been called "rheumatism supervisory centres." This tends, no doubt, to fill the clinic not only with "potential cardiacs," but even with "potential rheumatics," yet, surely, the right way to study rheumatic heart disease in children is in terms of the great systemic infection rather than as a static disease of a single organ.

4. In a less important and personal matter, I beg leave to state that I have never held nor expressed the view which Dr. Collis attributes to me, that "the environmental factors at work (of which cold and damp are the most important) must to some extent centre round the production of disease-infected tonsils." The phrase in brackets does not occur in my paper, nor does it correspond with anything in my mind.

As this exaggerated view has been attributed to me before in your correspondence columns and militates against the success of much for which I am striving, I should like to add that to call attention to cold damp as a possible factor in the production of juvenile rheumatism is no reason for my being credited (or debited) with the view that this is the chief thing operating. I hold that there are half a dozen predisposing factors, and where these "click" (as the saying is) there develops juvenile rheumatism. Of these factors, exposure to cold damp is one—sometimes absent, but often important.

I am, Sir, yours faithfully,
Harley-street, W., July 28th. REGINALD MILLER.

GLYCERINE IN THE TREATMENT OF SUPPURATIVE OTITIS MEDIA.

To the Editor of THE LANCET.

SIR,—When house surgeon to the Royal United Hospital, Bath, in 1884, it was difficult to treat satisfactorily cases of suppurative otitis media with the dry dressings then in vogue, because the out-patients were unable to attend with sufficient regularity. Something therefore had to be found for home use. I began with perchloride of mercury in glycerine 1 in 1000. The results were astonishing, recent cases completely recovered in a few days, and chronic cases after having resisted all other known forms of treatment. The value attributed to glycerine is its hygroscopic quality which permits it to search the innermost recesses of the suppurating sinuses with the antiseptic dissolved in it. I mentioned this treatment to my old friend, Prof. Rushton Parker, and we find him at the British Medical Association meeting at Newcastle in 1893 advocating it as routine treatment, on which reliance could be placed. He tried carbolic acid in glycerine, which is equally good. Whether perchloride of mercury or carbolic acid be employed, the glycerine must be neat without the addition of water. One case made a deep impression on me, that of an American who had had a discharge from his left ear for 30 years. There was a large perforation of the tympanic membrane at the lower and posterior quadrant which completely healed and his hearing returned. Now, years after my retirement, I come across cases among acquaintances and friends where all treatment has been given up in despair, but which recover under the glycerine perchloride application.

I am, Sir, yours faithfully,
T. PAGAN LOWE.

Charmouth, Dorset, July 24th.

POST-OPERATIVE MASSIVE COLLAPSE OF THE LUNGS.

To the Editor of THE LANCET.

SIR,—The importance of post-operative pulmonary complications is ably set out by Dr. C. R. Boland and Dr. J. E. Sheret in their paper on massive collapse of the lung, which appeared in your issue of July 21st (p. 111). The clinical description and the radiograms are admirable, but the explanation of the process seems inadequate. If the massive collapse be due to plugging of bronchi why should it be more frequent in upper abdominal operations, why should it be entirely independent of the anæsthetic administered, why should it occur at all ages with equal frequency, and why should it be met with in cases where there is not the least suspicion of bronchitis or increased bronchial secretion?

That a plugged bronchus can cause collapse of the lung is well known; undoubted cases have been seen and described. When a large bronchus is plugged the onset is sudden—absolutely sudden—and the patient becomes immediately urgently ill and cyanosed. The lung slowly deflates, and the patient becomes gradually accustomed to his diminished oxygenating area and regains comfort. Later on he begins to expectorate, and slowly recovers his pulmonary function. The degree of deflation is never as great as that seen in the most severe cases of massive collapse, and the breath sounds over the lung with a plugged bronchus are absent even before deflation has begun. Bronchial breath sounds are not heard. This picture is a complete contrast to that given by massive collapse which follows injury or operation Here the onset of symptoms is more gradual, dyspnœa appears within a few hours of the injury and gets worse, some slight duskiness may be detected, but cyanosis is seen only in the worse cases. Commonly both lungs are affected moderately, often one rather more than the other, usually the right base is the more deflated; but when one lung is affected the degree of deflation is considerable and may be complete. Respiration is quickened and shallow; on the affected side thoracic movement is limited, interspaces are indrawn during inspiration, and the abdomen is rigid. Breath sounds are weak at first, later become bronchial, and in complete deflation are absent except over the lung root.

Of the gunshot injuries which I saw during the late war I still possess records of 666 cases; of these a large number showed some bilateral deflation of the lungs; 30 showed massive collapse of one lung, and nine had complete collapse of one lung. Among many post-mortem examinations were two on men who died (8 and 14 hours after being wounded) apparently of lung collapse. My note is a follows:—

> The lungs are extremely small, only filling about a quarter of the pleural sacs. They are blue and solid-looking. Pieces of the lower lobes sink in water, but the upper lobes are crepitant. There is no evidence of any bronchial obstruction; the bronchi do not contain blood or any excess of secretion.

Two of the most marked examples of complete pulmonary deflation which I have seen occurred in (1) a soldier shot through the upper part of the left shoulder—lung and pleura uninjured; (2) a girl of 18 who had a hemithyroidectomy under local anæsthesia. Neither of these cases showed cough or expectoration at any time.

Plugging of a bronchus is then an inadequate explanation of post-operative or traumatic collapse of the lungs because it fails to explain: (1) the common bilateral and occasional extensive unilateral deflation; (2) the gradual extension of deflation to the upper lobe of the affected lung; (3) the presence of bronchial breath sounds and increased vocal resonance in the affected lung.

As a result of my experience of examination of hundreds of men with thoracic wounds during the late war, examinations which were clinical, X ray, visual at the time of operation, and, in a number of cases, post mortem; also of the examination of a considerable number of cases of lung complications following operation since the war, I suggest that massive collapse of the lung can only be explained adequately on the following theory.

1. That as a result of a stimulus applied to the body somewhere between the hyoid and the pubes (these are the limits within which in my personal experience injuries have been followed by massive collapse) a reflex constriction of bronchioles is set up.

2. That normally this reflex affects both lungs equally, and results in a decrease in the lung volume with raising of the diaphragm on both sides, and an increase in the negativity of intrapleural pressure. This condition was well seen and was very common in the wounded soldiers in France. In men who had small pleural effusions as the result of a thoracic wound the intrapleural pressure was more negative than normal in spite of the effusion, and the removal of even a few ounces of fluid during the first 48 hours after the injury was likely to be followed by cyanosis, dyspnœa, and marked thoracic pain.

3. In some cases the reflex affects only one lung, not necessarily on the side of the injury, and massive collapse results. It may be that normally the whole bronchial tree dilates slightly during inspiration and again during expiration. Failure to dilate during inspiration with normal dilatation during expiration would lead to pulmonary deflation, and if the abnormality were unilateral to marked collapse.

If we suppose that a reversal of this supposed normal mechanism is possible, so that a normal inspiratory dilatation is converted into an inspiratory constriction of bronchi while the expiratory mechanism remains normal, a far greater degree of deflation is possible. A reversal of the conditions following an injury—that is, a reflex constriction of the bronchi during expiration with normal dilatation during inspiration—may explain the phenomena of asthma, in which expiration is longer than inspiration, and lung overdistension is found.

There are many data in experimental physiology which confirm the presence and action of both dilator and constrictor muscles in the bronchi, and the condition of the lungs in guinea-pigs killed by anaphylactic shock strongly suggests the reflex constriction of bronchi. But the importance of lung collapse lies in (1) its comparative frequency after operations of the upper abdomen, (2) its liability to be the starting-point of pneumonia, (3) the means to be taken to prevent it, (4) treatment. For prevention I believe that combined regional and general anæsthesia should be most effectual.

For treatment in the most marked cases I believe that the best procedure is to introduce a small quantity of air into the pleura on the side of the collapse. This allows the diaphragm to move normally, restores the mediastinum to its median position, and relieves distress—I am, Sir, yours faithfully,

K. DOUGLAS WILKINSON.

Birmingham, July 25th, 1928.

To the Editor of THE LANCET.

SIR,—In THE LANCET of July 21st Dr. Boland and Dr. Sheret advise post-operative postural drainage of the bronchial tree, as a prophylactic of massive collapse, in other words, removal of the secretions when formed. May I suggest that a better method, and one more truly prophylactic, is to prevent the formation of the secretions? In a fairly long experience, extending over many hundreds of abdominal operations, I cannot recall a single instance in which any kind of lung complication occurred, in any case in which the preoperative condition of the lungs was normal and the peritoneal cavity not infected. Instead of the usual preoperative hypodermic injection of atropine gr. $\frac{1}{100}$ with morphia gr. $\frac{1}{6}$ to $\frac{1}{4}$, the patient (adult) is given, half an hour before the operation, an injection of atropine gr. $\frac{1}{50}$ without morphia. This makes the patient so dry that, when he reaches the theatre, he can scarcely smack his lips. This dried-up condition usually persists throughout the operation and for some hours afterwards. Very exceptionally, and only if the patient is secreting profusely, atropine gr. $\frac{1}{50}$ is repeated, either at the end of the operation or after return to the ward. Nearly every case was anæsthetised with ether and was nursed, after operation, in the Fowler position.

I am, Sir, yours faithfully,

Plymouth, July 28th. C. HAMILTON WHITEFORD.

SMOOTH AND ROUGH VARIANTS OF BACTERIA.

To the Editor of THE LANCET.

SIR,—In a special article on this subject appearing in your issue of July 7th (p. 31), it is pointed out that many bacteriologists now recognise that there are wide adaptive fluctuations within the "species," or races, of many bacteria. Later on, however, the writer remarks that the observations of Todd [1] and Cowan [2] are inconsistent, by which I presume he means that both these authors cannot be right because the former found that the rough colonies of streptococci were more virulent than the smooth, whereas the latter found that, as in most other bacterial races which exhibit this phenomenon, the smooth streptococci were relatively more virulent than the rough. Since this is the second time within a week that I have seen the same criticism of Todd and Cowan's results, I thought that a note on one experience at Greenwich might be of general interest.

If S and R are used merely as convenient terms to denote colony appearance without any implication of antigenic structure, then diphtheria bacilli (*Corynebacterium diphtheriæ*) show well-marked rough and smooth varieties when grown on certain culture media. During the years 1922 to 1924 I collected over 100 strains of *C. diphtheriæ*. The chances among this series that an R or S strain would be toxigenic or not were about equal. There was no correlation whatever between the two pairs of characters, R and S, and virulence and avirulence. During 1927 and 1928 nearly 200 strains of *C. diphtheriæ* were isolated from the same school and were examined for R and S qualities and toxigenicity by my co-worker, Surgeon-Commander Parker.[3] The R strains were all avirulent, without any exception, the S strains only produced five avirulent cultures. In this series, therefore, R was always correlated with lack of virulence while S forms were almost invariably virulent to guinea-pigs. I think this evidence, in the lack of any further information, would have been considered good enough by many workers to conclude that the rough variants of *C. diphtheriæ* were always atoxic. The evidence might have led me into such a mistake, but for my past experience and the fact that Parker examined a further 50 strains of *C. diphtheriæ* collected from the environment outside the school. This last series of cultures showed no significant agreement between these characters, the R and S varieties containing both virulent and avirulent strains. These investigations show that, in as distinct a "species" of bacterium as it is practicable to define, two characters could at one time be completely correlated, while in *the same place* at another time the same characters would show no significant correlation. Similarly in one environment, correlation was complete while at *the same time* in a different environment there was no agreement between the same sets of character.

The variability of bacteria is of such fundamental importance in medicine that two further recent observations bearing on this subject are worth noting. Whittle,[4] in a recent paper, makes a praiseworthy attempt to discover a reliable method of distinguishing pneumococci from streptococci. After confessing there are certain discrepancies between his results and that of other workers in the same field, he found bile solubility to be the most reliable criterion by which to recognise a pneumococcus. But after finishing his paper he had the bad luck to find a completely bile-insoluble Type I. pneumococcus which had to be put in a footnote. By a striking coincidence in the same number of the journal which contained the previous reference, Griffith[5] describes a fully virulent R variety of pneumococcus, the only exception he had found in his extensive experience, to the rule that R strains of pneumococci are relatively avirulent to mice when compared with S. Here were two "laws" which seemed inviolate until the exceptions turned up. After our experiences at Greenwich it is conceivable if Whittle or Griffith were to repeat their work in a different country or in 10 to 50 years' time the exception might have become the rule and the rule the exception! Hence there is no necessity to consider such observations as those of Todd and Cowan to be mutually incompatible, especially as these investigators only used a very small number of strains of streptococci in their experiments.

The very fact that there are so many apparent inconsistencies in bacteriological literature would indicate that incongruities are just as often due to bacterial variability, as to errors or differences in technique which is the explanation some bacteriologists still seem to prefer. The bacteria as a group are the most plastic of living organisms, and the different races fluctuate round a conventional specific type. It is one of the most important and difficult tasks of modern bacteriology to define the limits, and estimate the rapidity, of these adaptive fluctuations and to try to discover the environmental stimuli which produce them. Griffith's work, just referred to, is a brilliantly original attempt to do this in the case of pneumococcal types, whether his results are ever confirmed or not. We cannot be reminded too frequently that the "species concept" applied to bacteria is far less definite than when applied to the sexual metazoa. As long ago as 1912 Minchin[6] was uncertain if "species," in the strict biological meaning, occurred among the bacteria at all. Although I would not go as far as that, yet these doubts of an eminent worker in pure biology are a salutary subject for the worker in applied medical biology to ponder over.

I am, Sir, yours faithfully,

SHELDON F. DUDLEY.

Royal Naval College, Greenwich, July 26th, 1928.

CANCER AND DIET.

To the Editor of THE LANCET.

SIR,—On p. 192 of your last issue a speaker at the recent Cancer Conference is reported as saying that "a campaign had been going on amongst the medical profession that certain forms of food produced cancer. An eminent surgeon was even devoting his life to persuading the public that cancer was due to eating meat." As chairman of the Food Committee of the New Health Society and therefore closely connected with its dietetic propaganda, may I state that no such absurd statement has ever been issued by the Society or by its president. The ultimate damage that may accrue from long continued malnutrition and other results of a faulty diet may, in the opinion of some of us, help to explain the cancer problem. This is a theory that the public, at any rate, will be well advised to ponder and act upon.

I am, Sir, yours faithfully,

S. HENNING BELFRAGE.

New Health Society, London, July 31st, 1928.

THE MEDICAL DIRECTORY.

To the Editor of THE LANCET.

SIR,—The annual circular has been posted to each member of the medical profession. If the form has not been received, a duplicate will be sent on request. We shall be grateful for the return of the forms by an early post.—We are, Sir, yours faithfully,

J. AND A. CHURCHILL.

40, Gloucester-place, Portman-square, W. 1,
July 26th, 1928.

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[1] Todd, E. W.: Brit. Jour. Exper. Path., 1928, ix., 1.

[2] Cowan, M. L.: Ibid., 1927, viii., 6.

[3] Parker, H. B.: Ibid. (in the press).

[4] Whittle, C. M.: Jour. of Hyg., 1928, xxvii., 200.

[5] Griffith, F.: Ibid., 1928, xxvii., 114.

[6] Minchin, E. A.: An Introduction to the Study of the Protozoa, London, 1912, p. 141.

Obituary.

SIR ARTHUR CHANCE, F.R.C.S. & P. IREL., HON. F.R.C.S. EDIN.,

PAST PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS IN IRELAND.

WE regret to announce the death of Sir Arthur Chance, which occurred at his residence, Merrion-square, Dublin, on July 26th, after a long illness, at the age of 69 years. He had been for many years one of the most prominent members of the profession in Ireland and his death will be regretted by a large circle of patients and friends.

SIR ARTHUR CHANCE.

Photo by Lafayette.

Born in 1859, son of Albert Chance, of Dublin, he received his education in Dublin and obtained diplomas from the two Royal Colleges in 1880, and at once devoted himself to surgery. Whilst a very young man he was appointed surgeon to Jervis-street Hospital, and a few years later moved to the Mater Misericordiæ Hospital, with which he remained connected for the rest of his life. He took an active part in the work of the Council of the Royal College of Surgeons, of which College he was elected President in 1903. For many years past he has represented that body on the General Medical Council and last year was nominated as its representative on the Medical Registration Council of the Irish Free State, a post which, however, he had speedily to resign on account of ill-health. From 1917 to 1920 he was Inspector of Military Surgical Hospitals in Ireland, with the rank of colonel in the Army Medical Service. He filled a term as President of the Royal Academy of Medicine in Ireland, and was surgeon to more than one Viceroy of Ireland, so that when in 1905 he received the honour of knighthood the distinction had been anticipated for him by all who knew him. There were few public professional activities in Ireland in which he did not take an active share. Specially interested in education, he gave very useful service to the General Medical Council, while he was determinedly opposed to any change in the system of medical registration after the establishment of the Irish Free State.

Chance was a man of great versatility and quickness of intellect, who would have been successful in any profession he might have chosen to adopt. His prudent leadership and shrewd judgment will long be missed, and he will be remembered as having played an important part in Irish affairs at a time of special difficulty.

He married, first, Martha, daughter of Daniel Rooney of Belfast, and secondly, Eileen, daughter of William Murphy, of Dartry, who survives him with eight sons and five daughters. Three of his sons are members of the medical profession, one, Mr. Arthur Chance, being surgeon to Dr. Steevens' Hospital, Dublin.

Medical News.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—Diplomas of L.R.C.P. and M.R.C.S. have been conferred upon 167 candidates (136 men and 31 women) who have passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board, and have complied with the by-laws of the Colleges. The following are the names and medical schools of the successful candidates :—

G. Allen, Birmingham and London ; J. M. Anderson, Durham and Charing Cross ; W. R. Ashby, Cambridge and St. Bart.'s ; Julia C. H. Avery, St. Mary's ; Gertrude C. Banks, Royal Free ; S. Behrman, St. Bart.'s ; W. A. G. Bell, Cambridge and St. Thomas's ; A. Bennett, St. Bart.'s ; Mary Berkeley, Royal Free ; T. H. Berrill, Bristol ; S. P. Bhatia, Bombay and St. Thomas's ; C. H. Birt, Birmingham ; F. A. Blackwood, St. Thomas's ; Kathleen L. Bland and J. R. Bond, Univ. College ; V. G. Morgaonkar, Bombay and London ; N. J. Boulton and R. V. Bradlaw, Guy's ; J. V. Broad, Cambridge and St. George's ; Nellie Brown, Westminster ; E. C. B. Butler, London ; Beatrice A. Butterworth, Royal Free ; E. N. Callum, London ; Catherine F. Cameron, Cambridge and Royal Free ; L. A. Canaan, Yale and London ; Mavis H. D. Carr, Cambridge and Royal Free ; T. H. Carr and B. R. Caygill, Leeds ; Muriel G. E. Clark, Charing Cross ; W. A. Clements, Sheffield ; Nellie Clifton, Royal Free ; Lilian M. C. Clopet, Cardiff ; Dorothy M. Conyers, Royal Free ; T. M. Corcoran, Univ. College ; O. J. C. Cotton, Cambridge and St. Thomas's ; E. Courtin, St. Thomas's ; J. H. Crawford, Cambridge and St. Mary's ; A. T. Croucher, St. Mary's ; A. M. Cunningham, Cambridge and Univ. College ; D. W. Currie, Leeds ; T. Dagger, Liverpool ; A. Danin, Guy's ; H. W. Daukes, St. Thomas's ; W. P. M. Davidson, St. Bart.'s ; E. L. F. De Mel, Ceylon ; W. F. de Villiers, Cape and London ; P. Dickman, Cape and Charing Cross ; C. J. V. Dobbin, Guy's ; G. H. Dobney, Middlesex ; J. F. Duesbury, Birmingham ; J. W. Ellis, Guy's ; R. C. S. Evans, Cardiff ; A. C. Fisher and Cecilia F. Fox, Bristol ; P. H. Fox Cambridge and St. Bart.'s ; E. Fulford, Guy's ; G. H. Garfield, Cardiff ; R. J. S. Garrow, St. Thomas's and Leeds ; F. W. Gilbert, Guy's ; Agnes G. Gillespie, Liverpool ; Y. Gimpelson, Royal Free and St. Mary's ; L. Godlove, Leeds ; S. Goldman and J. P. Gubbins, London ; J. C. Heather, Guy's ; Kathleen M. Henderson, Laurel K. Heny, Helen M. Herbert, and Alice D. M. Hodge, Royal Free ; F. E. G. Hopkins, Cambridge and Guy's ; D. R. House, Bristol ; I. M. Hughes, Manchester ; E. A. Hunter, London ; M. Jafar, Punjab ; M. K. Jilani, Lahore and Liverpool ; A. W. Johns, London ; S. Kaul, Punjab and St. Bart.'s ; G. H. Kennett, Sydney ; B. Kettle, St. Bart.'s ; G. G. King, Madras and St. Mary's ; M. L. Kreitmayer, St. Bart.'s ; Nellie I. Lanckenau, Royal Free and Univ. Coll. ; Kenneth E. Lane, Guy's ; T. C. Larkworthy, Cambridge and St. George's ; E. G. Laurence, St. Bart.'s ; R. R. Leaning, St. Mary's ; J. C. Leigh, Leeds ; G. Leighton, Birmingham ; G. E. Lewis, Cambridge and London ; I. B. Limbery, St. Thomas's ; Kathleen M. MacLaren, Westminster ; G. C. C. MacVicker, Cambridge and St. Bart.'s ; M. J. Malley, St. Bart.'s ; F. B. Mallinson, St. George's ; H. M. Mikhail, Univ. College ; Hermia M. Mills, Royal Free ; L. Milner, S. Africa and Guy's ; W. E. S. Moreton, Charing Cross ; R. H. Morley, Leeds ; I. Morris, Univ. College ; L. H. Morris, Cambridge and London ; O. N. Morris, King's College ; J. E. Morton, Guy's ; Millicent Moseley, Birmingham ; J. H. Moynihan, Charing Cross ; Bhavani Natarajan, Bombay ; L. A. Newton, St. Bart.'s ; H. G. Nimbalker, Bombay and Middlesex ; G. P. Nixon, St. Bart.'s ; G. W. Oliphant, Guy's ; E. G. M. Palser, Univ. College ; A. W. Patton, St. Bart.'s ; Margaret E. Peaker, King's College ; M. G. Pearson, Oxford and Westminster ; A. L. P. Peeney, Manchester ; R. L. P. Peregrine, Oxford and Guy's ; F. Phillips, Adelaide and London ; J. A. Pocock, Cambridge and Univ. College ; H. G. Pritchard, Oxford and Charing Cross ; N. L. Probert, Cardiff and Middlesex ; A. Rabinowitz, Berlin and Middlesex ; R. H. Raine, Durham ; R. J. H. Raines, Leeds ; E. A. P. S. Rawlings, Charing Cross ; R. G. E. Richmond, St. Thomas's ; D. T. Robinson, Manchester ; J. B. Robinson and W. P. Roe, Guy's ; M. V. Samuel, Adelaide and London ; Eluned Saunders, Cardiff and Westminster ; Christine F. T. Saville, Univ. College ; E. H. Sears, Guy's ; H. M. Sein, Calcutta and Guy's ; H. Selby-Brown, Guy's ; H. T. Simmons, Manchester ; W. H. Simonds, Cambridge and St. Thomas's ; D. Sivasubrahmaniam, Madras and London ; Constance B. Smith, King's College ; Edith J. L. Smith, Royal Free ; Elizabeth S. Smith, Birmingham ; E. H. Spickett, St. Bart.'s and Cardiff ; T. T. Stamm, Guy's ; D. M. Stern, Cambridge and London ; R. Ström-Olsen, Cardiff ; A. B. Sullivan, Sydney and London ; A. B. Taylor, Birmingham ; J. G. Thwaites, St. Thomas's ; B. Timothy, Madras and London ; W. E. Tucker, Cambridge and St. George's ; G. N. Unnithan, Madras and Univ. College ; B. T. Utley, St. George's ; L. E. Vine, Bristol ; F. H. Ward, Cambridge and St. Bart.'s ; D. K. Weston, Guy's ; D. B. J. Wijeyesekera, Ceylon and King's College ; P. Wiles, Middlesex ; Gladys E. Wilkinson, Manchester ; G. G. Willcox, Cambridge and St. Thomas's ; Enid M. Williams, Cardiff ; L. D. Williams, Cardiff and Guy's ; W. A. Wilson, Univ. College ; E. W. Winch, Cambridge and St. George's ; H. S. H. Wood, Middlesex ; J. L. M. Wood, Sheffield ; Elsie E. Wright, Royal Free and St. Mary's ; T. C. Yip, St. Bart.'s ; and H. D. R. Zscherpel, Madras and St. Bart.'s.

repeated, either at the end of the operation or after return to the ward. Nearly every case was anæsthetised with ether and was nursed, after operation, in the Fowler position.

I am, Sir, yours faithfully,

Plymouth, July 28th. C. HAMILTON WHITEFORD.

SMOOTH AND ROUGH VARIANTS OF BACTERIA.

To the Editor of THE LANCET.

SIR,—In a special article on this subject appearing in your issue of July 7th (p. 31), it is pointed out that many bacteriologists now recognise that there are wide adaptive fluctuations within the "species," or races, of many bacteria. Later on, however, the writer remarks that the observations of Todd [1] and Cowan [2] are inconsistent, by which I presume he means that both these authors cannot be right because the former found that the rough colonies of streptococci were more virulent than the smooth, whereas the latter found that, as in most other bacterial races which exhibit this phenomenon, the smooth streptococci were relatively more virulent than the rough. Since this is the second time within a week that I have seen the same criticism of Todd and Cowan's results, I thought that a note on one experience at Greenwich might be of general interest.

If S and R are used merely as convenient terms to denote colony appearance without any implication of antigenic structure, then diphtheria bacilli (*Corynebacterium diphtheriæ*) show well-marked rough and smooth varieties when grown on certain culture media. During the years 1922 to 1924 I collected over 100 strains of *C. diphtheriæ*. The chances among this series that an R or S strain would be toxigenic or not were about equal. There was no correlation whatever between the two pairs of characters, R and S, and virulence and avirulence. During 1927 and 1928 nearly 200 strains of *C. diphtheriæ* were isolated from the same school and were examined for R and S qualities and toxigenicity by my co-worker, Surgeon-Commander Parker.[3] The R strains were all avirulent, without any exception, the S strains only produced five avirulent cultures. In this series, therefore, R was always correlated with lack of virulence while S forms were almost invariably virulent to guinea-pigs. I think this evidence, in the lack of any further information, would have been considered good enough by many workers to conclude that the rough variants of *C. diphtheriæ* were always atoxic. The evidence might have led me into such a mistake, but for my past experience and the fact that Parker examined a further 50 strains of *C. diphtheriæ* collected from the environment outside the school. This last series of cultures showed no significant agreement between these characters, the R and S varieties containing both virulent and avirulent strains. These investigations show that, in as distinct a "species" of bacterium as it is practicable to define, two characters could at one time be completely correlated, while in *the same place* at another time the same characters would show no significant correlation. Similarly in one environment, correlation was complete while at *the same time* in *a different environment* there was no agreement between the same sets of character.

The variability of bacteria is of such fundamental importance in medicine that two further recent observations bearing on this subject are worth noting. Whittle,[4] in a recent paper, makes a praiseworthy attempt to discover a reliable method of distinguishing pneumococci from streptococci. After confessing there are certain discrepancies between his results and that of other workers in the same field, he found bile solubility to be the most reliable criterion by which to recognise a pneumococcus. But after finishing his paper he had the bad luck to find a completely bile-insoluble Type I. pneumococcus which had to be put in a footnote. By a striking coincidence in the same number of the journal which contained the previous reference, Griffith[5] describes a fully virulent R variety of pneumococcus, the only exception he had found in his extensive experience, to the rule that R strains of pneumococci are relatively avirulent to mice when compared with S. Here were two "laws" which seemed inviolate until the exceptions turned up. After our experiences at Greenwich it is conceivable if Whittle or Griffith were to repeat their work in a different country or in 10 to 50 years' time the exception might have become the rule and the rule the exception! Hence there is no necessity to consider such observations as those of Todd and Cowan to be mutually incompatible, especially as these investigators only used a very small number of strains of streptococci in their experiments.

The very fact that there are so many apparent inconsistencies in bacteriological literature would indicate that incongruities are just as often due to bacterial variability, as to errors or differences in technique which is the explanation some bacteriologists still seem to prefer. The bacteria as a group are the most plastic of living organisms, and the different races fluctuate round a conventional specific type. It is one of the most important and difficult tasks of modern bacteriology to define the limits, and estimate the rapidity, of these adaptive fluctuations and to try to discover the environmental stimuli which produce them. Griffith's work, just referred to, is a brilliantly original attempt to do this in the case of pneumococcal types, whether his results are ever confirmed or not. We cannot be reminded too frequently that the "species concept" applied to bacteria is far less definite than when applied to the sexual metazoa. As long ago as 1912 Minchin [6] was uncertain if "species," in the strict biological meaning, occurred among the bacteria at all. Although I would not go as far as that, yet these doubts of an eminent worker in pure biology are a salutary subject for the worker in applied medical biology to ponder over.

I am, Sir, yours faithfully,

SHELDON F. DUDLEY.

Royal Naval College, Greenwich, July 26th, 1928.

CANCER AND DIET.

To the Editor of THE LANCET.

SIR,—On p. 192 of your last issue a speaker at the recent Cancer Conference is reported as saying that "a campaign had been going on amongst the medical profession that certain forms of food produced cancer. An eminent surgeon was even devoting his life to persuading the public that cancer was due to eating meat." As chairman of the Food Committee of the New Health Society and therefore closely connected with its dietetic propaganda, may I state that no such absurd statement has ever been issued by the Society or by its president. The ultimate damage that may accrue from long continued malnutrition and other results of a faulty diet may, in the opinion of some of us, help to explain the cancer problem. This is a theory that the public, at any rate, will be well advised to ponder and act upon.

I am, Sir, yours faithfully,

S. HENNING BELFRAGE.

New Health Society, London, July 31st, 1928.

THE MEDICAL DIRECTORY.

To the Editor of THE LANCET.

SIR,—The annual circular has been posted to each member of the medical profession. If the form has not been received, a duplicate will be sent on request. We shall be grateful for the return of the forms by an early post.—We are, Sir, yours faithfully,

J. AND A. CHURCHILL.

40, Gloucester-place, Portman-square, W. 1,
July 26th, 1928.

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[1] Todd, E. W.: Brit. Jour. Exper. Path., 1928, ix., 1.

[2] Cowan, M. L.: Ibid., 1927, viii., 6.

[3] Parker, H. B.: Ibid. (in the press).

[4] Whittle, C. M.: Jour. of Hyg., 1928, xxvii., 200.

[5] Griffith, F.: Ibid., 1928, xxvii., 114.

[6] Minchin, E. A.: An Introduction to the Study of the Protozoa, London, 1912, p. 141.

in Orthopædic Surgery: Esmé M. Gilroy. Wellcome Medals and Prizes in the History of Medicine: Gold Medal, W. A. Bain; Silver Medal, J. A. P. Cameron. Cunningham Memorial Medal and Prize in Anatomy: T. H. Brown. Whiteside Bruce Bursary: J. A. Baty.

Society of Apothecaries of London.—At recent examinations the following candidates passed in the subjects indicated:—

Surgery.—K. E. Clarke, Charing Cross Hosp.; K. G. Milad, St. Mary's Hosp.; and H. Tenenbaum, Nancy and London Hosp.

Medicine.—M. K. Bryce, London Hosp.; J. P. Collinson, Sheffield and London Hosp.; N. Das, London Hosp.; W. B. Hallums, St. Mary's Hosp.; A. H. Hennessey, Adelaide and London Hosp.; E. P. Johnson, Manchester; E. A. Lipkin, Liverpool; and H. S. Marks, Guy's Hosp.

Forensic Medicine.—T. A. Barnabas, Bristol; P. C. Basu, Calcutta; H. C. Clifford-Smith, Charing Cross Hosp.; J. P. Collinson, Sheffield and London Hosp.; H. H. Jackson, Manchester and Charing Cross Hosp.; E. P. Johnson, Manchester; A. A. Leibovitch, Kharkoff and London Hosp.; T. A. P. Proctor, Birmingham; and H. Tenenbaum, Nancy and London Hosp.

Midwifery.—T. A. Barnabas, Bristol; P. C. Basu, Calcutta; J. S. B. Bray, Cambridge and St. Bart.'s Hosp.; A. R. D'Abreu, Leeds; H. W. E. Dickey, Manchester; N. H. Kettlewell, Middlesex Hosp. and Bristol; and S. M. Rahman, Calcutta and Middlesex Hosp.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: P. C. Basu, M. K. Bryce, H. E. Clarke, W. B. Hallums, and H. S. Marks.

University of Belfast.—Dr. A. M. Drennan has been appointed to the chair of pathology in the University. A graduate of Edinburgh, Prof. Drennan, at present occupies the chair of clinical pathology in the University of Otago, New Zealand.

Course of Instruction for D.P.H.—A three months' course of lectures and demonstrations on clinical practice and in hospital administration will be given at the North-Eastern Hospital, St. Ann's-road, Tottenham, London, N., by Dr. F. H. Thomson, the medical superintendent, on Mondays and Wednesdays, at 4.45 P.M., and alternate Saturdays at 11 A.M., beginning on Oct. 1st. Further information may be had from the clerk to the Metropolitan Asylums Board, Victoria Embankment, E.C. 4.

The late Mr. Charles Curd.—The death occurred on July 28th of Mr. Charles Curd in his seventy-third year. A native of Bath, he received his medical education at Charing Cross Hospital, qualified as L.S.A. in 1878 and M.R.C.S. in 1879, and held a house appointment at the hospital. After practice at Amersham and Liskeard he returned to Bath, where he was for many years closely identified with the work of the Royal United Hospital, being chairman of the Board of Management in 1925 and a trustee at the time or his death. During the war he rendered excellent service at the Bath War Hospital. A prominent Freemason, he devoted much of his time to local affairs, and for some time represented Lansdown Ward on the Board of Guardians.

Animal Diseases Research Association.—A donation of £10,000 has been given anonymously to this association, whose headquarters are at Aberdeen, in order to strengthen and increase the research staff.

Secretaryship of St. Thomas's Hospital.—A presentation on behalf of the governors and medical staff of St. Thomas's Hospital, London, has been made to Mr. G. Q. Roberts, C.B.E., who is now retiring from the position of secretary and receiver, which he has held for the last 25 years. Mr. Roberts's successor will be Lieut.-Colonel A. P. B. Irwin, D.S.O., who has been assistant secretary since 1922.

The late Dr. G. O. McKane.—Dr. George Oliphant McKane, who died at Cleethorpes on July 26th in his eighty-first year, had spent nearly half a century in medical practice. He gained the Scottish triple qualification in 1875, and retired only three or four years ago. The last 20 years of his active life were lived at Waltham, near Grimsby, where he carried on a large country practice. He was also medical officer of health to the Grimsby Rural District Council, and poor-law medical officer and public vaccinator to the fourth district of the Grimsby Union. A man of strong and cheerful personality he had great powers of sympathy, and enjoyed the confidence of his patients to a remarkable degree. Dr. McKane was a native of Hexham, and before studying medicine qualified as a chemist. He was for many years in practice at Byers Green, Co. Durham, and Leeds. His two sons are members of the medical profession.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Bills Advanced.

In the House of Lords on Friday, July 27th, the Reorganisation of Offices (Scotland) Bill was read the third time. In the House of Commons the Food and Drugs (Adulteration) Bill was read the third time.

HOUSE OF COMMONS.

Wednesday, July 25th.

Ex-Service Man and Sleepy Sickness.

Sir Henry Cowan asked the Secretary of State for War whether his attention has been called to the case of Alfred Lines (whose blue medical sheet was endorsed Fit for service in any part of the world), who joined the Middlesex Regiment on June 4th, 1926, served with the Shanghai defence force in China until afflicted with sleepy sickness, returned to England and was discharged from Netley Hospital as physically unfit for any form of military service on Nov. 11th, 1927, with a sum of £1, and who, after waiting for his official discharge papers, received a communication from Chelsea Hospital, dated Dec. 5th, 1927, stating that he was not entitled to any discharge pension and offering him a gratuity of £6 only, less deduction of any advances that had been made to him; and whether, having regard to the fact that his panel doctor had certified that Lines would never be able to work again and that the symptoms of the disease which necessitated his discharge from the Army first appeared during his military service with the Shanghai defence force, he would consider granting this man some compensation more adequate than the amount of 7s. 9*d.* actually paid him as the balance of the gratuity of £6.—Mr. Duff Cooper (Financial Secretary to the War Office) replied: This case has been carefully reviewed at the War Office, and the Army medical authorities are satisfied that the disability was not caused by military service. In the circumstances, Mr. Lines has no claim to compensation, and the small gratuity awarded is the appropriate grant in his case.

Replying to further questions in regard to Mr. Lines's case, Mr. Duff Cooper said the War Office could not allow the principle to be established that anybody who happened to fall ill while on military service should by that fact alone be entitled to some compensation. There was no evidence to show that this man's illness was in any way connected with his being sent abroad. It was not an illness to which soldiers were subject through their being sent abroad.

Health of the Merchant Service.

Dr. Vernon Davies asked the President of the Board of Trade if he would consider the advisability of coöperating with the Minister of Health to issue an annual report on the health of the merchant service, bearing in mind that the seaman's mortality from disease exceeded the average by 48·8 per cent., and his mortality from violence by 4·30 per cent.—Mr. Herbert G. Williams (Parliamentary Secretary to the Board of Trade) replied: My right hon. friend will consult the Minister of Health with regard to the suggested preparation of an annual report on the health of the merchant service, and I will let my hon. friend know the result in due course.

Tuberculosis Mortality-rate.

Sir Robert Thomas asked the Minister of Health whether he was aware that there had been since 1910 little reduction in the tuberculosis mortality-rate for males between the ages of 15 and 25, while for females between these ages the rate had increased; and what measures he proposed to take to improve the position.—Sir Kingsley Wood replied: The answer to the first part of the question is in the affirmative, but the rate for both males and females between these ages appears at the present time to be decreasing. The discrepancy between the rate of decrease in the mortality from tuberculosis in the general population and that in the groups referred by the hon. Member has been under consideration in my department, but my right hon. friend is advised that its causes are obscure. Investigation is proceeding, and the tuberculosis officers of local authorities will be asked to give special attention to the question.

Thursday, July 26th.

Treatment of Casual Paupers.

Mr. Shepherd asked the Minister of Health whether, in view of the number of unemployed men and women now tramping the roads in search of employment, he proposed to revise the regulations concerning their treatment, with special regard to food, sleeping, medical inspection, searching, task work, detention, washing, and method of obtaining

The undermentioned diplomas were conferred (jointly with the Royal College of Surgeons) upon the following candidates:—

DIPLOMA IN OPHTHALMIC MEDICINE AND SURGERY.

C. H. Ackroyd, C. H. Bamford, W. J. Chapman, A. L. El Kirdani, Charlotte E. Fisher, B. B. Ghosh, J. B. Hamilton, R. J. Harley-Mason, D. R. Jadeja, D. Katz, G. L. Khirwadkar, D. G. Kotibhaskar, F. J. Lavery, H. H. Mahmood, T. M. O'Neill, F. W. G. Smith, A. F. Stewart, J. M. Thomson, A. Walbank, and J. Wood.

DIPLOMA IN PUBLIC HEALTH.

D. R. Bernhardt, R. A. D. J. Bernhardt, H. P. Billimoria, H. St. C. Colston, A. C. Counsell, G. I. Davies, C. H. Dhala, M. Farid, F. Harris, G. H. Hayes, Margaret Holdsworth, D. R. Jandial, Iris A. Jenkin-Lloyd, Eva M. Malmberg, S. N. Michaels, Josefine W. Nagel, M. A. Nicholson, F. W. Oldershaw, D. B. Parakh, Jessie L. Robb, Mary Schofield, Beatrice M. Smithies, Josephine I. Terry, D. L. Tucker, and G. R. Waller.

Diplomas in Laryngology and Otology and in Psychological Medicine have been conferred upon candidates whose names appeared in our issue of July 21st (p. 153).

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—At an ordinary meeting of the College held on July 26th, with *Sir John Rose Bradford, the President, in the chair*, the following were elected members:—

Charles N. Armstrong, Ramananda Bandyopadhyay, Philip Bayer, John L. Edwards, Frank R. Fletcher, Robert D. Gillespie, Frank Goldby, Hamilton Hartridge, Thomas R. Hill, Horace Joules, Charles E. Kellett, Robert M. B. Mackenna, Patrick H. O'Donovan, Ian H. K. Stevens, and Arthur S. Wesson.

Licences to practise medicine were conferred on 167 candidates whose names appear above.

Mr. Arthur Sturgess Hollins, M.B. Camb., M.R.C.P., of King's College Hospital, was awarded the Murchison Memorial Scholarship.

The following officers of the College, members of committees, and examiners were elected for the ensuing year:—

Censors.—Lord Dawson of Penn, Dr. J. S. Collier, Dr. A. P. Beddard, and Dr. R. A. Young.

Treasurer.—Dr. S. P. Phillips.

Registrar.—Dr. Raymond Crawfurd.

Harveian Librarian.—Dr. Arnold Chaplin.

Assistant Registrar.—Dr. R. O. Moon.

Library Committee.—Dr. F. Parkes Weber, Dr. H. C. Cameron, Dr. H. R. Spencer, and Dr. C. J. Singer.

Curators of the Museum.—Dr. J. M. Bruce, Dr. C. E. Lakin, Dr. William Hunter, and Dr. J. H. Thursfield.

Finance Committee.—Dr. H. Morley Fletcher, Sir John Broadbent, and Dr. J. H. Thursfield.

Examiners.—Chemistry: Mr. H. W. Cremer and Mr. W. H. Hurtley. Physics: Mr. J. H. Brinkworth and Mr. D. Orson Wood. Practical Pharmacy: Dr. W. J. Adie, Dr. Hugh Gainsborough, Dr. Newman Neild, Dr. V. J. Woolley, and Dr. Orlando Inchley. Physiology: Dr. B. J. Collingwood and Dr. Swale Vincent. Anatomy: Dr. G. Elliot Smith. Pathology: Sir Frederick Andrewes and Dr. Charles Bolton. Medical Anatomy and Principles and Practice of Medicine: Sir Percival Hartley, Dr. A. G. Phear, Dr. Herbert French, Dr. A. E. Russell, Dr. Cecil Wall, Dr. J. A. Nixon, Dr. Frederick Langmead, Dr. C. E. Lakin, Dr. D. H. de Souza, and Dr. F. M. R. Walshe. Midwifery and Diseases Peculiar to Women: Dr. Cuthbert Lockyer, Dr. Eardley Holland, Dr. Malcolm Donaldson, F.R.C.S., Dr. William Gilliatt, and Dr. Stanley Dodd. Public Health: Part I., Dr. J. H. Ryffel; Part II., Dr. Charles Porter. Tropical Medicine: Dr. J. C. G. Ledingham and Dr. H. H. Scott. Ophthalmic Medicine and Surgery: Dr. Grainger Stewart. Psychological Medicine: Part I., Dr. Edward Mapother; Part II., Dr. J. Porter Phillips and Dr. Bernard Hart. Laryngology and Otology: Dr. D. R. Paterson.

Sir Humphry Rolleston was re-elected as representative on the Executive Committee of the Imperial Cancer Research Fund.

Sir Wilmot Herringham was appointed to deliver the Harveian Oration, and Dr. J. A. Arkwright, F.R.S., the Bradshaw Lecture in 1929. The following further appointments were announced: Dr. G. F. Still as Fitzpatrick Lecturer for 1929; Dr. R. A. Young as Lumleian Lecturer for 1929; Dr. E. B. Verney as Goulstonian Lecturer for 1929; Dr. F. M. R. Walshe as Oliver-Sharpey Lecturer for 1929; The Rt. Hon. H. A. L. Fisher as Lloyd Roberts Lecturer for 1929; and Sir Charles Martin as Croonian Lecturer for 1930.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following candidates for the Triple Qualification have been approved and have been admitted as Licentiates:—

FINAL EXAMINATION.

Betty C. Hamilton, E. A. Downes, John Campbell, D. A. Herd, A. J. A. Gray, Oscher Stern, J. L. Dudgeon, C. V. Salisbury, S. K. *Pillai*, M. J. S. *Pillai*, A. M. D'Cotta, Maud Heaton, H. S. Lawrence, A. F. B. Mackay, A. El Sayed El Khishin, A. B. Mendis, Robert Rajaretnam Tamber, N. S. Fraser, C. L. X. S. Muttukumaru, I. M. Chisholm, A. M. Fraser, David Bendel, Barney Schulman, F. E. Ll. Stewart, Harry Lazarus, H. M. C. de Silva, B. S. Swani, E. H. B. Gooch, W. D. Alvis, Aaron Jacorovitch, R. A. F. M. Saunders, A. J. F. Almeida, F. A. Silva, and J. S. Goonting.

The following have satisfied the examiners in the undermentioned subjects:—

Medicine.—J. T. F. Pearse, J. H. Brush, D. N. Chisholm, H. A. Mohamed, Gerald Kahn, Hope Lazarus, L. O. Abeyaraine, Chrysostom Joseph, Leslie Myers, A. K. M. Attia, S. S. Nagi, and Hyam Saacs.

Surgery.—J. R. Martin, J. T. F. Pearse, Hanna Barsoum, J. H. Brush, C. H. Wilkie, C. Joseph, Leslie Craig, Okunade Ajibade, A. L. Malik-Mansour, A. K. M. Attia, Hugh Craig, and Kandiah Kanagasabapathy.

Midwifery and Gynæcology.—J. R. Martin, F. R. B. H. K[illegible] J[illegible] L[illegible] Brink, and Hyams Saacs.

Medical Jurisprudence and Public Health.—M. C. Smith, W. O. Molander, F. R. B. H. Kennedy, W. P. Kennedy, G. G. Brown, H. G. Somerville, Margaret Leslie, John McConnell, Amin Madwar, Dorothy Williams, R. L. Allan, L. C. Leslie, Harry Michaelson, Agnes F. Millar, R. T. Amour, J. E. Morrison, J. W. Gregory, and W. V. Anderson.

UNIVERSITY OF EDINBURGH.—At a graduation ceremonial on July 18th the following degrees were conferred:—

M.D.

†Harry Bedingfield, ‡J. C. R. Buchanan, J. J. B. Edmond, F. W. Gavin, ‡C. G. Gooding, James Gray, ‡Muriel G. Henderson, ‡J. C. Hodgson, J. C. Macgown, J. D. P. M'Latchie, ‡G. W. Milroy, *J. W. T. Patterson, N. H. Smith, and A. J. Wilson.

* Awarded gold medal for thesis.
† Highly commended for thesis.
‡ Commended for thesis.

M.B., CH.B.

K. A. Abayomi, J. A. Adams, W. A. D. Adamson, Ian Aird, S. W. H. Askari, E. L. Bartleman, D. F. Baxter, H. C. Benson, K. S. P. Blatchley, §G. I. H. Braine, Dorothy D. W. Brander, Jane P. H. G. Brown, J. S. Brown, §John Bruce, §A. M. Calder, §J. C. Clark, C. W. Clarke, J. L. Cover, J. D. Crerar, J. J. Cruickshank, F. H. A. L. Davidson, William Davidson, D. B. Davies, R. H. Dawson, J. B. Dewar, J. R. Dogra, C. R. E. Downing, I. D. Easton, J. C. Edwardes-Jones, [illegible] Finlayson, J. A. C. Fleming, §T. M[illegible] argaret D. Gillan, T. W. Gillespi[illegible] lroy, Alexander Gordon, A. A[illegible] erg, H. G. Hanan, K. N. A. Herc[illegible] §I. G. W. Hill, Alice E. Hodge, R. M. Honey, J. L. M. Jeffares, A. J. Jones, H. M. King, D. F. Laing, C. R. D. Leeds, A. J. M'Cutcheon, W. A. M'Dowall, J. H. M'Elney, T. N. MacGregor, F. C. M. M'Ilwrick, P. D. M'Kenna, D. E. Mackenzie, J. A. M'Lauchlan, A. D. Macleod, J. G. S. M'Queen, Malcolm Macvicar, G. H. Marshall, Bernard Matheson, J. A. Melanson, William Miller, T. A. H. Munro, C. P. M. Neethling, R. F. Ogilvie, A. R. Oliver, A. S. Paterson, J. B. Patrick, L. B. Patrick, D. P. Pick, F. B. Platt, D. B. Purves, Balwant Ram, E. B. Rayner, T. A. Redhead, A. D. Reid, G. J. Roberts, Donald Robertson, J. D. Robertson, C. A. Rogan, P. K. Shand, William Shaw, A. F. S. Silver, Alexander Simpson, John Sinclair, G. P. Smith, John Stevenson, R. T. Thin, R. S. Thompson, §I. M. Tod, §Ta-Ming Tso, A. J. Vakil, R. H. Vartan, Vera M. Walker, S. L. Ward, M. H. Watthews, J. S. Webster, A. H. Weston, and J. S. Westwater.

§ Passed with honours.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.

G. W. Gale.

DIPLOMA IN RADIOLOGY.

G. G. Allan, A. J. W. Allen, R. S. MacHardy, W. J. Mowat, and F. G. Stephens.

The Cameron P[illegible] has been awarded to Dr. [illegible] of Microbiology in the [illegible] gnition of the importance [illegible] herapeutic action of bismuth.

Medals, prizes, and scholarships were conferred as follows:—Thesis Gold Medal: J. W. T. Patterson. Ettles Scholarship and Leslie Gold Medal: I. G. W. Hill. Gunning Victoria Jubilee Prize in Pathology: J. D. A. Gray. Milner Fothergill Medal in Therapeutics: J. G. M'Crie. Allan Fellowship in Clinical Medicine and Clinical Surgery: I. G. W. Hill. Freeland Barbour Fellowship: A. B. Walker. M'Cosh Graduates and Medical Bursaries: A. S. Johnstone. Mouat [illegible] in the Practice of Physic: T. M'L. Gallow[illegible] rship in Midwifery and Gynæcolog[illegible] James Scott Scholarship in Midwifery: Vera M. [illegible] Beaney Prize in Anatomy and Surgery: I. M. Tod. Conan Doyle Prize: R. M'K. Honey. Annandale Gold Medal in Clinical Surgery: Ian Aird. Murdoch Brown Silver Medal in Clinical Medicine: Charles W. Clarke. Royal Victoria Hospital Tuberculosis Trust Gold Medal: J. B. Patrick. Scottish Association for Medical Education of Women Prize and Dorothy Gilfillan Memorial Prize: Vera M. Walker. Wightman Prize in Clinical Medicine: A. F. K. Clarkson and A. S. Paterson (*equal*). *Pattison* Prize in Clinical Surgery: I. G. W. Hill. Sir Robert Jones Prize in Orthopædic Surgery: Esmé M. Gilroy. Wellcome Medals and Prizes in the History of Medicine: Gold Medal, W. A. Bain; Silver Medal, J. A. P. Cameron. Cunningham Memorial Medal and Prize in Anatomy: T. H. Brown. Whiteside Bruce Bursary: J. A. Baty.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates passed in the subjects indicated:—

Surgery.—K. E. Clarke, Charing Cross Hosp.; K. G. Milad, St. Mary's Hosp.; and H. Tenenbaum, Nancy and London Hosp.

Medicine.—M. K. Bryce, London Hosp.; J. P. Collinson, Sheffield and London Hosp.; N. Das, London Hosp.; W. B. Hallums, St. Mary's Hosp.; A. H. Hennessey, Adelaide and London Hosp.; E. P. Johnson, Manchester; E. A. Lipkin, Liverpool; and H. S. Marks, Guy's Hosp.

Forensic Medicine.—T. A. Barnabas, Bristol; P. C. Basu, Calcutta; H. C. Clifford-Smith, Charing Cross Hosp.; J. P. Collinson, Sheffield and London Hosp.; H. H. Jackson, Manchester and Charing Cross Hosp.; E. P. Johnson, Manchester; A. A. Leibovitch, Kharkoff and London Hosp.; T. A. P. Proctor, Birmingham; and H. Tenenbaum, Nancy and London Hosp.

Midwifery.—T. A. Barnabas, Bristol; P. C. Basu, Calcutta; J. S. B. Bray, Cambridge and St. Bart.'s Hosp.; A. R. D'Abreu, Leeds; H. W. E. Dickey, Manchester; N. H. Kettlewell, Middlesex Hosp. and Bristol; and S. M. Rahman, Calcutta and Middlesex Hosp.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: P. C. Basu, M. K. Bryce, H. E. Clarke, W. B. Hallums, and H. S. Marks.

UNIVERSITY OF BELFAST.—Dr. A. M. Drennan has been appointed to the chair of pathology in the University. A graduate of Edinburgh, Prof. Drennan, at present occupies the chair of clinical pathology in the University of Otago, New Zealand.

COURSE OF INSTRUCTION FOR D.P.H.—A three months' course of lectures and demonstrations on clinical practicé and in hospital administration will be given at the North-Eastern Hospital, St. Ann's-road, Tottenham, London, N., by Dr. F. H. Thomson, the medical superintendent, on Mondays and Wednesdays, at 4.45 P.M., and alternate Saturdays at 11 A.M., beginning on Oct. 1st. Further information may be had from the clerk to the Metropolitan Asylums Board, Victoria Embankment, E.C. 4.

THE LATE MR. CHARLES CURD.—The death occurred on July 28th of Mr. Charles Curd in his seventy-third year. A native of Bath, he received his medical education at Charing Cross Hospital, qualified as L.S.A. in 1878 and M.R.C.S. in 1879, and held a house appointment at the hospital. After practice at Amersham and Liskeard he returned to Bath, where he was for many years closely identified with the work of the Royal United Hospital, being chairman of the Board of Management in 1925 and a trustee at the time or his death. During the war he rendered excellent service at the Bath War Hospital. A prominent Freemason, he devoted much of his time to local affairs, and for some time represented Lansdown Ward on the Board of Guardians.

ANIMAL DISEASES RESEARCH ASSOCIATION.—A donation of £10,000 has been given anonymously to this association, whose headquarters are at Aberdeen, in order to strengthen and increase the research staff.

SECRETARYSHIP OF ST. THOMAS'S HOSPITAL.—A presentation on behalf of the governors and medical staff of St. Thomas's Hospital, London, has been made to Mr. G. Q. Roberts, C.B.E., who is now retiring from the position of secretary and receiver, which he has held for the last 25 years. Mr. Roberts's successor will be Lieut.-Colonel A. P. B. Irwin, D.S.O., who has been assistant secretary since 1922.

THE LATE DR. G. O. MCKANE.—Dr. George Oliphant McKane, who died at Cleethorpes on July 26th in his eighty-first year, had spent nearly half a century in medical practice. He gained the Scottish triple qualification in 1875, and retired only three or four years ago. The last 20 years of his active life were lived at Waltham, near Grimsby, where he carried on a large country practice. He was also medical officer of health to the Grimsby Rural District Council, and poor-law medical officer and public vaccinator to the fourth district of the Grimsby Union. A man of strong and cheerful personality he had great powers of sympathy, and enjoyed the confidence of his patients to a remarkable degree. Dr. McKane was a native of Hexham, and before studying medicine qualified as a chemist. He was for many years in practice at Byers Green, Co. Durham, and Leeds. His two sons are members of the medical profession.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Bills Advanced.

IN the House of Lords on Friday, July 27th, the Reorganisation of Offices (Scotland) Bill was read the third time. In the House of Commons the Food and Drugs (Adulteration) Bill was read the third time.

HOUSE OF COMMONS.

WEDNESDAY, JULY 25TH.

Ex-Service Man and Sleepy Sickness.

Sir HENRY COWAN asked the Secretary of State for War whether his attention has been called to the case of Alfred Lines (whose blue medical sheet was endorsed Fit for service in any part of the world), who joined the Middlesex Regiment on June 4th, 1926, served with the Shanghai defence force in China until afflicted with sleepy sickness, returned to England and was discharged from Netley Hospital as physically unfit for any form of military service on Nov. 11th, 1927, with a sum of £1, and who, after waiting for his official discharge papers, received a communication from Chelsea Hospital, dated Dec. 5th, 1927, stating that he was not entitled to any discharge pension and offering him a gratuity of £6 only, less deduction of any advances that had been made to him; and whether, having regard to the fact that his panel doctor had certified that Lines would never be able to work again and that the symptoms of the disease which necessitated his discharge from the Army first appeared during his military servicé with the Shanghai defence force, he would consider granting this man some compensation more adequate than the amount of *7s. 9d.* actually paid him as the balance of the gratuity of £6.—Mr. DUFF COOPER (Financial Secretary to the War Office) replied: This case has been carefully reviewed at the War Office, and the Army medical authorities are satisfied that the disability was not caused by military service. In the circumstances, Mr. Lines has no claim to compensation, and the small gratuity awarded is the appropriate grant in his case.

Replying to further questions in regard to Mr. Lines's case, Mr. Duff Cooper said the War Office could not allow the principle to be established that anybody who happened to fall ill while on military service should by that fact alone be entitled to some compensation. There was no evidence to show that this man's illness was in any way connected with his being sent abroad. It was not an illness to which soldiers were subject through their being sent abroad.

Health of the Merchant Service.

Dr. VERNON DAVIES asked the President of the Board of Trade if he would consider the advisability of coöperating with the Minister of Health to issue an annual report on the health of the merchant service, bearing in mind that the seaman's mortality from disease exceeded the average by 48·8 per cent., and his mortality from violence by 4·30 per cent.—Mr. HERBERT G. WILLIAMS (Parliamentary Secretary to the Board of Trade) replied: My right hon. friend will consult the Minister of Health with regard to the suggested preparation of an annual report on the health of the merchant service, and I will let my hon. friend know the result in due course.

Tuberculosis Mortality-rate.

Sir ROBERT THOMAS asked the Minister of Health whether he was aware that there had been since 1910 little reduction in the tuberculosis mortality-rate for males between the ages of 15 and 25, while for females between these ages the rate had increased; and what measures he proposed to take to improve the position.—Sir KINGSLEY WOOD replied: The answer to the first part of the question is in the affirmative, but the rate for both males and females between these ages appears at the present time to be decreasing. The discrepancy between the rate of decrease in the mortality from tuberculosis in the general population and that in the groups referred by the hon. Member has been under consideration in my department, but my right hon. friend is advised that its causes are obscure. Investigation is proceeding, and the tuberculosis officers of local authorities will be asked to give special attention to the question.

THURSDAY, JULY 26TH.

Treatment of Casual Paupers.

Mr. SHEPHERD asked the Minister of Health whether, in view of the number of unemployed men and women now tramping the roads in search of employment, he proposed to revise the regulations concerning their treatment, with special regard to food, sleeping, medical inspection, searching, task work, detention, washing, and method of obtaining admission.—Mr. CHAMBERLAIN replied : No, Sir. I am not aware of any reason for the revision of the regulations in force, which do, as the hon. Member is aware, make special provision for casuals genuinely in search of employment. I think it is important that there should be general and complete compliance with the regulations, and I am giving my officers further special instructions to impress upon guardians and their staffs the necessity of securing this full compliance in cases in which there is any default.

Shortage of Water in Derbyshire.

Mr. DUNCAN asked the Minister of Health whether he was aware of complaints of the short supply of water for domestic purposes in the parish of South Normanton, in the Blackwell rural district council area, Derbyshire ; whether this shortage covered a period of years ; whether complaints had previously been made to the Ministry of Health ; whether the local authorities had laid any proposals before the Ministry for approval, and whether there was any delay occasioned in his department in this matter ; and whether he was prepared to take immediate action with a view to terminating the present shortage and providing the area with a full supply sufficient for the general health and domestic needs of the inhabitants.—Mr. CHAMBERLAIN replied : The answers to the first four parts of the question are in the affirmative, and to the sixth part in the negative. In reply to the fifth part, an outline of a joint scheme was submitted to me in April, 1927, and provisionally approved in January last, but in the meantime further difficulties have arisen in connexion with the risk of subsidence. In reply to the seventh part of the question, I have directed one of my inspectors to make a local investigation with a view to expediting temporary relief, and I am hoping to receive from the local authorities concerned definite proposals for a permanent scheme on satisfactory lines.

New Cancer Hospital in Manchester.

Sir THOMAS WATTS asked the Minister of Health if his attention had been called to the proposed establishment of a cancer hospital in Palatine-road, Withington, a residential district of Manchester ; and, having regard to the depreciation in the value of property in the district which would result, would he set up an inquiry into the matter.—Mr. CHAMBERLAIN replied : The answer to the first question is in the negative. If, as I assume, the reference is to the establishment of a voluntary hospital, I am not aware that it is open to me to take any action.

Traffic Noises in Urban Streets.

Sir ROBERT THOMAS asked the Home Secretary whether he was aware that there is a growing volume of public protest against the noise of urban streets ; that it was endangering the lives of sick people and undermining the fitness even of those in normal health ; that it interfered with education and lowered the efficiency of business ; that experts estimated that 60 per cent. of the noise was preventable ; and that it would continue to increase unless action was taken ; and whether he would, in conjunction with the Ministers of Health and Transport, make an effort to deal with these conditions.—Sir W. JOYNSON-HICKS replied : I am aware that there is much complaint, and I think with good ground. I have done all in my power to see that the nuisance is abated, so far as this is possible, by police action under existing powers, and I will certainly consult with my right hon. friends as to whether anything further can be done.

Sir R. THOMAS : Is the right hon. gentleman aware that a high medical authority at a meeting of the British Medical Association last week estimated that the loss in efficiency to the nation owing to these noises amounted to no less a sum than £1,000,000 a week ?

Sir W. JOYNSON-HICKS : Yes, I have noticed that.

Lieut.-Commander KENWORTHY : Will the right hon. gentleman consult with the Prime Minister about this in view of the probability that the present laws are insufficient to deal with the growing noises ?

Mr. LANSBURY : Will the right hon. gentleman communicate with the London County Council and ask them to keep the tramway tracks in order and thus prevent the most infernal noises ?

Sir W. JOYNSON-HICKS : I will communicate with the Minister of Transport whose duty it would be, I think, to communicate with the London County Council.

Captain CROOKSHANK : Will the right hon. gentleman look into the practice which obtains in the United States of zoning certain areas where certain noises are prohibited ?

Sir R. THOMAS said that this was a fearfully important question, and he thought that the House ought to get from the Home Secretary something more than they had had. The right hon. gentleman had said that he would consult with his Ministerial colleagues. Could he do so and report to the House before the end of the session ?

Sir W. JOYNSON-HICKS said that he would take the opportunity of discussing the matter with his colleagues, but whether it would be possible to answer a definite question before the end of the session he could not say.

Conjunctivitis in the Artificial Silk Industry.

Mr. KELLY asked the Home Secretary whether reports had been received from his inspectors about the increase in injuries suffered by men and women engaged in the artificial silk industry.—Sir WILLIAM JOYNSON-HICKS replied : I have received reports by the inspectors which I am glad to state show that, except in one works where there has been a large increase in the number of persons employed, the number of cases of conjunctivitis has, during recent months, been decreasing. As the hon. Member knows, this industry is receiving the closest attention both from the staff generally and from the medical inspectors, and much has been, and is being, done to improve the conditions.

Early Treatment of Mental Disease.

Dr. VERNON DAVIES asked the Minister of Health if he was aware that the only hope of reducing the incidence of insanity and improving the recovery-rate was by altering the law so as to allow and encourage the early and skilled treatment of persons mentally ill ; and if he would, at any early date, give this matter his serious consideration and take the necessary action.—Mr. CHAMBERLAIN replied : I should be sorry to think that the *only* hope of reducing the incidence of insanity and improving the recovery-rate lay in the measures which my hon. friend suggests. But I fully realise the great importance of improving the facilities for early mental treatment, and as I have frequently stated, I hope to be able to take the necessary action as soon as it is practicable to introduce legislation.

Regional Medical Officers and Drug Prescriptions.

Mr. SHORT asked the Minister of Health whether any special sum was allocated for the payment of drugs prescribed by panel doctors ; whether he was aware that regional medical officers had recently brought pressure upon panel doctors respecting their prescriptions and thereby limiting their discretion in prescribing medicines for panel patients, and that the East Sussex Insurance Committee, at its meeting on July 3rd, expressed its view that a practitioner should not cease to prescribe drugs which he believed to be reasonably necessary for the adequate treatment of panel patients ; and if he would explain the nature of the instructions given to regional medical officers on this matter.—Mr. CHAMBERLAIN replied : As regards the first part of the question, I would refer the hon. Member to the reply given to a question on April 4th. I am aware of the views expressed by the East Sussex Insurance Committee. The duty of insurance practitioners is to prescribe proper and sufficient medicines, and the purpose of the interviews arranged between certain practitioners and regional medical officers is solely to secure that this duty is performed.

MONDAY, JULY 30TH.

Welsh Board of Health.

Mr. JOHN asked the Minister of Health if the reason for the change in the composition of the promotion board in the office of the Welsh Board of Health was due to the alleged internal difficulties ; and whether he had received complaints with regard to the action of the promotion board in recommending promotions.—Mr. CHAMBERLAIN replied : The answer to both questions is that troubles in regard to promotion have been part of the internal difficulties of the past, and that the change in question seems to me the best way of securing a better position in the future.

Analysts and Food and Drugs Adulteration Bill.

Mr. CECIL WILSON asked the Minister of Health whether, in regard to the Food and Drugs (Adulteration) Bill, any consultation had taken place with the Institute of Chemistry, or the Society of Analysts, or other similar bodies ; and, if not, for what reason.—Mr. CHAMBERLAIN replied : No, Sir. As the object of the Bill is not the amendment but the consolidation of the existing law, its preparation was a purely legal matter, and it was not considered necessary to consult the bodies mentioned. I understand, however, that the Society of Public Analysts communicated with the Joint Committee on Consolidation Bills, and that the Committee considered the Society's views on the Bill.

Sewage Effluvia and Public Health.

Mr. LOOKER asked the Minister of Health whether he was aware that the effluvia coming from the sewage disposal works of the West Kent Sewerage Board constituted a menace to the health of the inhabitants of the parish of West Thurrock : and if he would take steps in the matter.—Mr. CHAMBERLAIN replied : I am not aware that there is any menace to health from this cause. I understand that officials of the District Council and the Sewerage Board have been conferring on the subject and I am ascertaining the position.

TUESDAY, JULY 31ST.

Use of Preservatives in Cream.

Mr. **THOMAS KENNEDY** asked the Secretary of State for Scotland if he had considered any representations made to him by the distributors of fresh cream in Scotland regarding the loss involved in the observance of the regulations prohibiting the use of preservative in cream; if he was aware that large quantities of cream sent daily from the creameries was unfit for use before it reached its destination; that as a consequence tinned foreign cream was rapidly taking the place of home-produced double fresh cream in the Scottish market; that the foreign cream was inferior in food value; that before the passing of the present regulations a harmless and minute quantity of boron preservative was allowed, which was sufficient to keep cream in perfect condition for three days or more; and if he would now consider the desirability of suspending the regulations referred to.

Mr. **WESTWOOD** asked the Secretary of State for Scotland if he had received any communication from the distributors of fresh double cream drawing his attention to the effect of the prohibition of the use of 0·04 per cent. of boron preservative in cream; and, if so, what action, if any, he proposed in the interests of farmers, distributors, and the general public.—Sir J. **GILMOUR** replied: Representations on the various points mentioned in the questions have been received but, for reasons which I have already given, I am not prepared to suspend the operation of the Preservative Regulations in regard to double cream. This matter has been long and carefully considered and the Scottish Board of Health are satisfied that if proper attention is given at all stages to the production of milk and the handling and transit of cream it ought to be possible to market fresh double cream in a sound condition. In regard to the suggestion that the amount of preservative added to double cream before the regulations came into operation was harmless and minute, I would point out that the amount used was 0·4 per cent., and that the Departmental Committee on Preservatives reported against the use of boric acid in foodstuffs in the interests of public health. So far as concerns the interests of farmers, the National Farmers Union of Scotland and the Scottish Agricultural Organisation Society have passed resolutions in favour of the prohibition of preservatives in cream.

Short Measure in the Sale of Milk.

Mr. **LOUGHER** asked the President of the Board of Trade whether, in respect of the sale of milk, he could state the cause of the delay in issuing regulations to enable adequate control to be maintained in connexion with methods of filling milk bottles; and whether he was satisfied that the public were at present adequately guarded against short measure being supplied.

Colonel **ENGLAND** asked the President of the Board of Trade if he was now operating the section of the Weights and Measures Act which prescribed the use of milk bottling and measuring machines; if so, when this section of the Act became operative; and what steps had been taken to carry it out.—Sir P. **CUNLIFFE-LISTER** replied: There is no Act of Parliament which prescribes the use of milk bottling and measuring machines, but draft regulations applying to such machines the general provisions of the Weights and Measures Acts are now under consideration by a small committee representative of local authorities and other interests concerned. I hope to be able to issue the draft shortly for public information. In the meantime the provisions of the Sale of Food Act, 1926, which makes it an offence to give short measure, are available for the protection of the public.

Grants for Supply of Milk and Nourishment.

Mr. **THURTLE** asked the Minister of Health the total amount of economy in Exchequer expenditure he expected to effect by his proposals to local authorities to cut down their grants for the supply of milk and nourishment in connexion with maternity and child welfare work.—Mr. **CHAMBERLAIN** replied: It is estimated that the total amount of the Exchequer grants payable to local authorities in respect of their expenditure for this purpose during the present financial year will be about £12,000 less than would have been the case in normal circumstances.

Sun Helmets for Police Constables.

Lieut.-Commander **KENWORTHY** asked the Secretary of State for the Home Department if he would consider the issue of an approved type of sun helmet, especially to constables employed on traffic control in the middle of the streets during hot weather.—Sir W. **JOYNSON-HICKS** replied: The question has been considered, but our summers are usually so short and changeable that it has not hitherto been thought necessary to provide any special sun or straw helmets. When the weather is hot, orders are given for the removal of chin straps, and if the heat continues the question will be further considered.

Vacancies.

For further information refer to the advertisement columns.

Barry Accident and Surgical Hospital.—H.S. At rate of £200.

Bath, Royal United Hospital.—Asst. H.S. £100. Also H.S. and H.P. Each £120.

Belfast, City and County Borough of.—Med. Supt. O.H., &c. £2000.

Bolton, Townleys Hospital, Farnworth.—Second Asst. M.O. £225.

Bootle, Bootle Borough Hospital, Derby-road.—Sen. M.O. Also 2 Jun. M.O.'s. Each at rate of £150 and £125 respectively.

Brighton, Royal Sussex County Hospital.—H.S. £150.

Bristol Royal Infirmary.—H.P.'s, H.S.'s, also Dental H.S. Each at rate of £80.

Cardiff, Prince of Wales' Hospital.—H.S. £100.

Cardiff, University College.—Lecturer and Demonstrator in Anatomy.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. H.S. £100.

Chester County Mental Hospital.—Fourth Asst. M.O. £350.

City of London Hospital for Diseases of the Heart, &c., Victoria Park, E.—H. P. At rate of £100.

City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.

Coventry, Coventry and War[illegible] H.P. £125.

East London Hospital for [illegible] *for Women, Shadwell, E.*—H.P. [illegible]

Exeter, Royal Devon and Exeter Hospital.—Hon. Asst. Surgeon to Ear, Nose and Throat Department.

Glasgow, University of.—Gardiner Chair of Physiological Chemistry.

Great Yarmouth General Hospital.—H.S. £150.

Ilkeston, Borough of.—M.O.H. and School M.O. £800.

Infants Hospital, Vincent-square, Westminster.—H.P. At rate of £75.

Leeds, City of.—Asst. M.O.H. for Maternity and Child Welfare. £800.

Leeds, St. James' Hospital.—Res. Deputy Med. Supt. £450.

Liverpool University.—George Holt Chair of Pathology. £1200.

Manchester, Baguley Sanatorium.—Asst. M.O. £350.

Market Drayton, Salop, Cheshire Joint Sanatorium.—Asst. M.O. £250.

Newcastle-upon-Tyne, Wooley Sanatorium, near Hexham.—Asst. M.O. £350.

Newcastle-upon-Tyne, Hospital for Sick Children.—Hon. P. to Skin Dept.

Nottingham Children's Hospital.—Res. H.P. At rate of £150.

Nottingham City.—M.O.H. £1440.

Poplar Hospital for Accidents.—Radiographer. 10*s.* 6*d.* per session.

Reading, Royal [illegible] S. £150.

Rotherham, Rothe[illegible]0.

Royal College of [illegible]—Milroy Lecturer.

Tuberculosis Dis[illegible] *Laboratory, 114, New King's-road,* [illegible]—Tuberculosis Officer and Asst. M.O.H. £750.

West Bromwich, West Bromwich and District General Hospital.—Res. H.S., H.S., also Cas. H.S. Each at rate of £200.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Carnwath (Lanarkshire).

Births, Marriages, and Deaths.

BIRTHS.

BAKER.—On July 22nd, at Langton's Meadow, Farnham Common, Bucks, the wife of Ormonde A. Baker, M.B., of a son.

CAIRNS.—On July 29th, at Norfolk-road, N.W., the wife of Hugh Cairns, F.R.C.S., of a daughter.

MARRIAGES.

BREWS—CHURCHILL.—On July 24th, at All Saints', Great Holland, Essex, Richard Allan Brews, M.D., F.R.C.S., to Gwyneth Grace, only child of Rev. J. D. and Mrs. Churchill, late of Little Bentley Rectory, Essex.

KOHNSTAM—DUNN.—On July 28th, at Lewisham, Geoffrey L. S. Kohnstam, M.D., M.R.C.P. Lond., to Helen Lorna Dunn, M.R.C.S. Eng., L.R.C.P. Lond., only daughter of Mr. and Mrs. F. W. Dunn.

MCCULLOCH—WRIGHT.—On July 26th, at St. Ann's Church, Manchester, William Edward McCulloch, M.B., Ch.B., Pathologist, Nigeria (West African Medical Service), to Joan, youngest daughter of the late Ernest Chorley Wright and Mrs. Wright, of Brabyns Cottage, Marple, late of Stretford.

MEEHAN—STRATHDEE.—On July 25th, at St. Sylvester's Church, Elgin, Felix Patrick Meehan, M.B., Ch.B., to Ann Barclay, second daughter of Mr. and Mrs. James Strathdee, "Braehead," Botriphnie, Keith.

DEATHS.

CHANCE.—On July 26th, in Dublin, Sir Arthur Chance, F.R.C.S.I., F.R.C.P.I., F.R.C.S. Edin., in his 70th year.

CURD.—On July 27th, at Forbes Fraser Hospital, after two days' illness, Charles Curd, M.R.C.S., L.S.A., of Gay-street, Bath.

LEES.—On July 22nd, at Breifond, Boyne Park, Tunbridge Wells, Charlie Lees, M.R.C.S., L.R.C.P., L.D.S. Eng., aged 53.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

HERPES ZOSTER AND CHICKEN-POX.

CASES are always being reported in which herpes zoster and chicken-pox appear in the same household, or in which people develop varicella after being in contact with herpes zoster, and vice versa. The isolated examples must now number many hundreds and constitute a formidable obstacle to the dualists who maintain that there is no inherent connexion between the two conditions. J. von Bókay, in 1892, was the first to suggest a common ætiology, and much evidence in its favour has since been adduced. Dr. G. A. Esquier, for instance, has just described a case in which the two conditions appeared simultaneously.[1] The patient was a soldier of 21, who did not report sick until the fourth day of his attack of chicken-pox, when fever and, more particularly, severe pain in his left side, took him to hospital. At that time typical vesicles in all stages of development were found on the scalp and body and—more sparsely—on the face, neck, and buccal mucosa. There were none on the limbs nor on the left side, where the pain was, and on this area typical herpes zoster developed along the seventh intercostal nerve. The zona consisted of vesicles of varying maturity, the youngest being at the end of the nerve, and the oldest near its root. The number of lymphocytes in the cerebro-spinal fluid proved to be 28 per cubic millimetre, and the differential white cell count in the blood showed 42 per cent. of lymphocytes and only 15 per cent. of polymorphonuclear leucocytes. As the crusts fell off, the blood count returned towards normal. Dr. Esquier explains this case by assuming that the virus of varicella can be fixed either in the skin, or in the spinal ganglia, or in a segment of the cord, producing, respectively, an attack of chicken-pox, a herpes zoster, or the "zoster fever" of Landouzy. He feels that the dualist view is based rather on sentiment and theory than on precise, carefully observed facts amd serological proof. In this soldier each chicken-pox eruption was accompanied by an identical herpetic eruption, suggesting very strongly that the two eruptions depended strictly on a common ætiological factor. Dr. R. L. Thorold Grant[2] describes a case of varicella breaking out in a woman of 37 with severe bilateral herpes, and Dr. D. E. H. Cleveland[3] one of herpes in a mother, followed after the correct incubation period by varicella in her daughter, and then, after a second incubation period, the appearance of a typical varicella rash, accompanied by erythema nodosum of the legs, on the mother. Both these cases seem to support the theory of common origin. Again, Dr. von B. M. van Driel[4] had a Javanese man of 28 with a typical varicella rash following a herpes of the left upper arm, and another of 26 with a herpes following a varicella. He made the experiment of inoculating four children of varying ages, and two young men with fluid from herpetic blebs. Except for one of the young men, none of the subjects showed more than a slight erythema at the site of injection; this man fell ill 12 days afterwards with typical varicella. The children might have been expected to remain immune; some would think herpes a more likely reaction than varicella in the young man, but presumably chicken-pox is not endemic in Java.

The arguments in favour of common origin were well summarised by Dr. Flandin in the discussion on the first case. He said that, histologically, the vesicles in the two conditions are identical; biologically, there is an absolute specificity of the fixation reaction between the two; and, experimentally, the inoculation of the contents of herpes vesicles into children who have not had chicken-pox gives the same results as "varicellisation." Inoculation with herpes confers immunity to chicken-pox. Epidemiologically the incubation periods correspond. Dr. M. A. Netter and Dr. Achille Urbain have recently investigated the deviation of the complement in these cases. Out of 100 herpes subjects, of whom 84 had had no apparent contact with varicella, 93 showed deviation of the complement, whether the antigen were taken from varicellar or herpetic vesicles. Similarly the results with varicellar serum were identical with either antigen. These workers concluded that poisons like arsenic, bismuth, and mercury produce herpes by acting as "agents provocateurs" of a virus which up till then had been harboured with impunity by the patient.

At the Brussels Congress in 1926, Flandin suggested that chicken-pox might be an early manifestation—and, indeed, herpes is rare in children—while herpes was the later systematised form, appearing in a subject immunised against chicken-pox. On this hypothesis an attack of herpes would be a reinfection or the result of a lowered immunity from some infectious or toxic cause.

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[1] Bull. et Mém. de la Soc. Méd. des Hôp. de Paris, June 7th. Pp. 953.

[2] Med. Jour. Austral., 1927, i., 192.

[3] Can. Med. Assoc. Jour., 1927, xvii., 1299.

[4] Münch. med. Woch., 1927, ii., 1541.

THE TREATMENT OF ACUTE AND CHRONIC LARYNGITIS.

To the Editor of THE LANCET.

SIR,—Mr. Mollison, in his article on this subject in your issue of July 21st, mentions that faulty methods of voice production should be corrected. May I say that this should always include instruction in breathing through the nose, in view of the fact that one of the causes of laryngitis is inhalation of dust.

Most people are under the impression that they always breathe through the nose because they do not sit with their mouths open when not talking or singing. They do not realise that they breathe through the mouth when vocalising, and this means that the air is taken unwarmed, unmoistened, and unfiltered direct into the pharynx, larynx, windpipe, and lungs. Few know that it is possible to breathe through the nose without closing the mouth; indeed, many voice teachers state that it is impossible. At most it is conceded that though it *can* be done it involves undue pause and the making of a loud sniff. But both these objections are obviated if the necessary practice be carried out to make the dilators of the nostrils, and the soft palate, active and flexible. Breath can then be taken quickly and quite silently through the nose with the mouth open.

All voice users should be taught this, and to none is it more important than to actors and auctioneers, who speak in places that are laden with dust. If they will obtain instruction in the use of the voice, learn to breathe always through the nose, and follow the direction of their medical man to sniff up their nostrils a little of the medicated emollient that has been prescribed for them (and which, on inquiry I usually find they forget to do), they will be saved considerable pharyngeal irritation as well as the more serious laryngitis.—I am, Sir, yours faithfully,

KATE EMIL BEHNKE.

The Moor House, Lane End, Bucks, July 26th, 1928.

THE COST OF MOTOR ACCIDENTS.

Sir Arthur Stanley last week opened the new out-patient department of the Wolverhampton and Staffordshire Hospital, which has been erected as part of a reconstruction scheme to cost £45,000. He said that figures which had been compiled for him showed that the extra cost of motor accidents to the hospitals is £250,000 a year, of which some £30,000 is recovered from insurance companies. In addition to a large reception hall, the new department includes consulting and examination rooms for ear, throat, and nose cases; two consulting rooms for physicians and two for surgeons, with four examination rooms; rooms for the treatment of fractures and orthopædic cases; a small operating theatre; sterilising and anæsthetic rooms; a recovery room with eight beds for use after minor operations; an isolation room and a venereal diseases department.

Corrigendum.—In our report last week (p. 189) of the International Conference on Cancer, subject, "Diagnostic Methods," the remarks attributed to the Chairman in closing the discussion were actually made by Sir William Willcox.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

TUESDAY, August 7th.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Mr. Addison: Operations. 2 P.M., Dr. Shaw: Medical Out-patients.

WEDNESDAY.—10 A.M., Dr. Owen: Medical Diseases of Children. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 2.30 P.M., Mr. Donald Armour: Ward Visit.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Mr. Donald Armour: Operations. 2 P.M., Mr. MacDonald: Genito-Urinary Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 12 noon, Dr. Ironside: Clinical Demonstrations. 2 P.M., Mr. Sinclair: Surgical Out-patients.

SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose and Ear Operations. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily 10 A.M. to 5 P.M., Saturdays 10 A.M. to 1 P.M. Medical, Surgical, and Special Departments. Operations, Anæsthetic Course, &c.

St. Cyres Lecture

ON

HEART AND CIRCULATION IN A TROPICAL AVITAMINOSIS (BERI-BERI).

Delivered at the National Hospital for Diseases of the Heart, London,

BY PROF. K. F. WENCKEBACH, M.D., F.R.C.P.

(*From the First Medical Clinic, Vienna.*)

FORTY years ago, as a young doctor in my own country, I was intimately acquainted with the two Dutch scientists, Pekelharing and Winkler, who, as a government committee, had studied beri-beri in the Dutch Indies. In those days nothing was known of its ætiology; my authorities believed it to be an infectious disease. Eykman and Grijns had not yet discovered its causation, but many of its clinical features had been described, and it was generally known that, to quote a British poet—

> "Beri-beri is very, very
> Hard on the nerves——,"

and, moreover, very "hard on the heart" also. I was greatly impressed by the astonishing facts that patients seem to die of complete failure of the right heart only; that the opinion (accepted as a dogma) was that this heart failure must be due to a degeneration of the vagus nerve; that patients may die 24 hours after having been in seemingly good health; that there was an "idiopathic" hypertrophy of the whole heart with evident lack of contractile strength as the chief characteristic; and that vitamin B had a miraculous effect on a heart which refused to react to any cardiac drugs—all these facts suggested to me the existence of some quite peculiar morbid process. Some seven years ago I explained this important problem to a young friend, Dr. Aalsmeer, a lecturer on internal medicine at the medical school for native doctors at Surabaya (Java). He devoted a good deal of time and interest to the question and last autumn returned from the Dutch Indies with complete clinical records of the cardiac aspect of the disease. These data, illustrated by X ray photographs and electrocardiograms, provide us with a veritable "natural history" of the circulatory apparatus in beri-beri cases.

CAUSE, SYMPTOMS, AND TREATMENT OF BERI-BERI IN GENERAL.

The generally acknowledged ætiology lies in the absence of an accessory food factor (vitamin B), contained in the bran of rice and cereals. The disease makes its appearance where polished rice is the exclusive diet. Proof of this pathogenesis is furnished by the results of the sole treatment—viz., addition to the diet of vitamin-containing foodstuff, such as rice-bran, bran extracts, or a certain bean, known in Japan for over ten centuries (*Phaseolus radiatus*. Malayan: katjang idjoe). Even in very severe cases it relieves the serious symptoms. The principal pathological changes are:—

(*a*) Degenerative processes in the peripheral nervous system, damaging and even destroying the peripheral motor and sensory, as well as the sympathetic and parasympathetic elements. The symptoms are those of extensive polyneuritis.

(*b*) Anasarca and serous effusion in the large cavities. In chronic cases there may be a condition of extreme general atrophy and dryness of skin and tissues, the so-called "dry form."

(*c*) Heart disease, characterised by general feebleness of the circulation, palpitations on the slightest exertion, swelling of the liver and œdema, with general swelling of the limbs. This heart failure is very often the cause of death.

CLINICAL ASPECTS OF HEART AND CIRCULATION.

I rely on the work of Aalsmeer, correlating it with the earlier work of Vedder, Castellani, Chambers, and Manson, in English; of Scheube, Nocht, and Mense in German; of the Dutch authors Pekelharing and Winkler, Kieviet de Jonge, de Langen; and the many Japanese contributions, culminating in the important work of Shimazono, whose conceptions are in many respects identical with those of my collaborator.

The following points may now be taken as well established:—

1. From the beginning of the disease the whole heart, right and left, is enlarged; X rays show not only an enlargement to the right, but also bulging of the left auricle in the so-called "taille" (left upper border) of the heart shadow. The left ventricle, too, is clearly larger than normal. It is impossible to decide whether, in this first period, the enlargement is due to dilatation alone or to hypertrophy of the muscle wall also.

2. This enlargement and corresponding failure of the heart increases more or less rapidly, sometimes in a few hours, *but chiefly involves the right heart.* The prevalence of right heart failure and right heart widening and hypertrophy is mentioned by everyone who has studied the disease at the bedside and post mortem. A remarkable clinical manifestation is the disappearance of the apex-beat and the substitution for it of a curious wriggling, fluttering motion of the heart muscle, which the patient himself feels and which is easily seen on inspection and felt by palpating with the whole palm of the hand.

3. Increasing stasis takes place in the liver and venæ cavæ, and in acute cases this causes an enormous, painful swelling and bulging of the liver, ascites, and sometimes sudden death.

4. Even in the most serious cases there is never any irregularity of the heart, no extrasystoles, flutter, or fibrillation. The electrocardiogram never shows any disturbance of stimulus conduction. The ventricular complex is perfectly normal, and the size of the different waves rather exaggerated, the only peculiarity being a certain degree of preponderance of the right ventricle.

5. The pulmonary circulation is completely free from any sign of stasis, œdema of the lungs only showing itself in the last moments before death. There is no other disease of the lungs, no true emphysema, no arterio-sclerosis or spasm of the pulmonary arteries, which might cause right heart failure.

6. Apart from variations in the course, dependent on the relative intensity of neuritic manifestations on the one hand and of cardiac disease on the other, two forms of beri-beri are generally recognised—namely, a chronic and an acute, so-called pernicious and usually fatal form. The latter is now much less often seen than it used to be, since specific treatment has almost abolished it.

7. The whole series of heart remedies and diuretics (digitalis, strophanthin, caffeine, theobromine, thyroid, novasurol, salyrgan, &c.) is of no real use for the beri-beri heart. Vitamin B alone is an immediate and usually complete success. At autopsy the heart shows enlargement of its cavities and apparent hypertrophy of its walls, both much more pronounced in the right side of the heart. Microscopically there are no striking changes in the heart muscle-fibres and no inflammation.

DILATATION AND FAILURE OF THE RIGHT HEART.

The first unsolved problem of the beri-beri heart is the extreme widening and failure of the right heart in contrast with the relative smallness of the left ventricle and the absence of pulmonary stasis. This seems the more enigmatic, as there is proof that both sides of the heart suffer at the beginning of the disease. The soft and frequent pulse, however, the curious wriggling motion of the enlarging heart, and the progressive over-filling of the proximal parts of the venous system (v. cavæ and liver), are undeniable signs of the heart's incapacity to convey the whole quantity of affluent blood from the venous into the arterial side of the vascular system. Clinical experience has taught me *that in such cases of increasing insufficiency of the whole heart the right heart is doomed beforehand to suffer much more than the left, and even to suffer to the profit of the latter.* If the strength of systole is decreasing in both ventricles equally, the moment will come at which both ventricles will fail to discharge their contents completely. A larger amount of residual blood than normal is retained in the heart. This larger post-systolic ventricular blood volume, together with a normal onflow of blood during the diastole, must necessarily result in a greater filling of the heart at the beginning of the next systole. This increased load will soon become too much for a heart already unable to discharge a normal quantity of blood. The output will become smaller and smaller, the filling of the arteries will be less, and the diastolic filling of the heart and the venous stasis before the entrance port of the heart must both increase. This being so, two factors will establish a marked difference between the right and left heart.

The first of these is the anatomical inequality of the two ventricles, the right being of lighter build, and provided with a thinner wall. The tricuspid valves are implanted on a much weaker ground than the mitral; there is no strong fibrous ring supporting them, they are condemned to share the distension of the right ventricle, and consequently are more liable to incompetence. Once this incompetence is established, blood passes from the right heart backwards into the veins and liver and the arterial output of the right ventricle is greatly reduced.

A still more important factor is at work. In the blood stream, moving "quasi in circulo," the right heart is located higher up the river than the left. As a consequence, the right heart has to deal under all circumstances with the whole volume of blood returning from the periphery to the heart, *the left heart not receiving more blood than the right heart is able to transmit.* Consequently the right heart is all the time struggling for life against an ever-increasing overfilling and widening, but the left heart is spared a similar burden. *The more the right heart suffers and fails, the safer the left heart becomes,* working under easy conditions and decreasingly threatened by such factors as might lead to overfilling and dilatation.

In such circulatory disturbances, despite a smaller output of the left heart, this smaller minute volume will reach the great veins and the right heart in due time. This holds good even in severe degrees of mitral stenosis, in which an extremely high arterial blood pressure may be maintained. Even after the final standstill of the heart in the first moments of death this function of the arterial wall (perhaps the last of life) is maintained, so that post mortem the arteries are found empty and the venous system filled. Therefore a smaller supply of blood to the aortic system cannot be expected to relieve the difficulties of the right heart in the same way as a smaller supply to the pulmonary arteries relieves the left heart.

These explanations make it possible to understand the cardiac and circulatory phenomena of beri-beri, the initial widening of the whole heart, the ever-increasing bulk of the right heart, the ever-decreasing cardiac systolic output, and the progressive engorgement of the proximal venous system, venæ cavæ, and liver. It is now easy to see how in acute attacks of beri-beri a sudden failure of the right ventricle with tricuspid incompetence puts the great veins and the liver under systolic ventricular pressure. These are distended to the highest degree and sudden death ends a condition of extreme suffering, the horror of which was so dramatically described by Manson in his handbook of tropical diseases. Throughout this unsuccessful struggle of the right heart the lung fields on the X ray plate are quite clear; there is no lung stasis, no râles, and no pulmonary œdema, and the left heart is not greatly enlarged but, on the contrary, is smaller and poorly filled. A small and rapid, but fairly palpable, pulse gives proof of the relative competence of the left ventricle, until at the last moment before death the latter loses its systolic power, succumbs, and leaves the lungs with stagnating blood and signs of ante-mortem œdema.

This simple mechanism, which explains the whole circulatory complex of beri-beri and the post-mortem findings, has great importance for general cardiology. The so-called safety-valve action of the tricuspid valve, hepatic stasis relieving the lung from threatening high tide, is familiar to a good number of us, but well-defined conditions of functional heart disease, involving both sides of the heart equally, are rather rare. They may be found in the course of acute infectious diseases (pneumonia, diphtheria, and others), but here so many different toxic and reflex influences complicate the picture that the separate influence of each is not easily discriminated. Another condition in which both sides of the heart are hampered in their action to exactly the same extent is rapid paroxysmal tachycardia and auricular flutter and fibrillation. In otherwise normal hearts it has been possible to show *that here also there is marked stasis in the large veins and liver coincident with absence of lung stasis, râles, and dyspnœa.* Since James Mackenzie discovered the change of circulation caused by the onset of what he called auricular paralysis, now known as fibrillation, in long-standing mitral stenosis, we have been acquainted with sudden, painful swelling of the liver; from personal experience this change is often accompanied by a striking improvement in respiration, and relief of the suffocating dyspnœa.

Once I recognised this mechanism, I was able to find it in a great many cases of slowly progressive, general myocardial weakness. Careful treatment, with well-apportioned doses of digitalis and diuretics, may cause lung œdema and swelling of the liver to disappear, even in extreme conditions, but only for a time. These intervals, during which equilibrium between the right and left heart is maintained with difficulty, become shorter and shorter, until at last treatment fails and the patient dies in a few hours. In many of these cases of recurrent heart failure the first and chief symptom is a rapid and very painful swelling of the liver. Even in rapidly fatal cases the same symptoms may be found, râles and lung œdema only showing themselves during the last hours of life.

In all these conditions the curious relationship between right and left heart failure may be recognised, but nowhere is it so uncomplicated, so regular, and so easily demonstrable as in the beri-beri heart. Thus there is a law of circulatory correlation between the two sides of the heart which may be formulated as follows: *In equal and increasing feebleness of the whole heart muscle the patient suffers most and dies from the failure of the right side of the heart only.*

Shimazono and Aalsmeer do not accept the conventional view that degeneration of the vagus fibres is the cause of the heart failure. Considerable dilatation of the heart may be present long before the first manifestations of polyneuritis. There is no parallelism between the degree of degeneration of nerve-fibres and that of the heart affection; indeed, it is the strong, apparently still healthy patient who seems to be most liable to the serious sudden acute attacks, in contrast with the patient whose first symptoms are those of palsy from polyneuritis. Aalsmeer is probably right in thinking that the relatively good nerve-fibres of the strong man enable him to undertake an amount of exercise which asks too much of his already weakened heart and induces the sudden attack of heart failure.

This vagal factor being unacceptable, we have to seek other clinical facts that would reveal the one potent unknown factor of this disease. *The* first hint is given by reasoning that, in our explanation of the development of myocardial failure in beri-beri, there seems to be no place for the hypertrophy of the heart muscle so often described. Why *should* the muscle that from the very beginning is showing all the signs of reduced contractile force and lessened output become hypertrophic? Such conceptions as "hypertrophie passive par faiblesse du myocarde," or "the individual fibres becoming weaker . . . an attempt is therefore made to compensate by increasing the number of fibres—i.e., hypertrophy," do not elucidate the problem. The only way out of the difficulty seemed to be to look for another explanation of the post-mortem findings of increased weight of the whole heart and increased thickness of the muscle walls.

Aalsmeer found that, even in the worst conditions of failure, the beri-beri heart gives a perfectly normal electrocardiogram, without arrhythmia, extrasystoles, heterotopic rhythms or disturbance of conductivity in the bundle or in the conducting fibres of the ventricle. This fact reminded me that the old observations of MacWilliam record non-contracting heart muscle without disturbance of conductivity. Thirty years ago Engelmann found that the frog's heart muscle when immersed for a short time in water loses its contractility but retains its excitability and its power of stimulus conduction, showing that this phenomenon, discovered by Biedermann in voluntary muscle, holds good also for heart muscle. Later de Boer demonstrated that the swelling of the heart muscle, caused by the water, reduces mechanically the contractile power of the muscle-fibre, but at the same time the electrocardiogram may continue completely unchanged. Skramlik, Lusanna, Zondek, and Kraus demonstrated the same phenomenon for other forms of water retention in muscle-fibres, and even found that the size of the waves of the electrocardiogram may be enlarged and the rate of conduction increased. The presence in beri-beri also of this strange contrast between evident weakening of the heart muscle and the undisturbed or accelerated automatic excitatory processes suggests that here also *the nature of the affection might be water retention* ("Quellung") *with consequent swelling of the heart muscle-fibres*, and that this swelling, rather than a true hypertrophy, may be the cause of the increased weight and thickness of the heart muscle wall as found post mortem.

THE WATER RETENTION HYPOTHESIS.

Many arguments support this hypothesis. A few months ago Tiemann showed that striated, in contrast with smooth muscle-fibres, swell in water and in all hypertonic solutions. The gain in weight and the swelling, due to the quantity of water taken up, is less in heart muscle than in common voluntary muscle. If the same process is at work in beri-beri we should expect to find the skeletal muscles swollen at the same time as the heart. This swelling is, in fact, typical of the disease, especially at the beginning, long before general tissue œdema or signs of nerve degeneration appear. Swelling is most conspicuous in the muscles of the calf, which are very painful in walking and on being pinched. Pekelharing, Winkler, and Nocht compared the condition with the "pseudo-hypertrophic stage" in progressive muscular atrophy of childhood.

On this hypothesis we should expect that no treatment can succeed which does not free the heart muscle from its surplus water and drain the muscle-fibre. When vitamin B is given, the heart rapidly diminishes in size and recovers its power of contraction, and the skeletal muscles share in this process. The hard, thickened, and painful muscles of the calf melt away, as snow in the sun, to muscles of normal size and function. De Langen, in his new monograph on beri-beri, mentions this rapid disappearance of the swelling and equally rapid cure of the motor paralysis, less than 24 hours after taking vitamin B-containing food. This remarkable improvement is accompanied by a marked increase in the secretion of urine. Scheube states that katjang idjoe had the reputation in Japan a thousand years ago of being a good diuretic. Of recent years the diuretic action of rice-bran and katjang idjoe has been specially investigated by Japanese scientists.[1] From the extensive work on the regulation of water exchange by Magnus and by the Vienna Pharmacological Institute (E. P. Pick, Molitor Baer) we learn that striated muscle may take up and, under certain circumstances, can retain large quantities of water injected into the blood or taken by the mouth. Our muscular system may be regarded as one of the biggest water reservoirs, and its contents do not appear on the balance of intake and output.

Recent research work by Tsunoda and Kura[2] gives important information concerning the anatomy and treatment of beri-beri. In pigeons exclusively fed on polished rice the sensory nerves and their endings in the skin show curious primary regressive metamorphosis accompanied by swelling and other changes in their microscopical appearance. After the injection of small doses of vitamin B all these changes and their clinical consequences disappear rapidly. The endings of the sensory and motor nerves improve rapidly within five hours after the injection. Twenty-four hours later the histological appearance is practically normal.

The conception of water-retention in the heart muscle-fibre explains all the symptoms and peculiarities of the beri-beri heart, which thus constitutes a hitherto unrecognised and unique form of heart muscle disease. Before trying to bring this curious pathogenesis into relation with other well-known facts of physiology and general pathology, I must mention an equally unique phenomenon in the symptomatology. Not only is the electrocardiogram normal during the whole course of the disease, but the rate of conduction is increased and the atrio-ventricular interval is shortened. Moreover, conduction quickens as the heart failure progresses. In the most serious and acute cases the shortest atrio-ventricular intervals were found when the patient seemed to be in imminent danger of death. With recovery the conduction slowed down to normal, even with slowing of the rate of the heart beat. The fact that the same phenomenon was found experimentally in water-swelling of the heart muscle is a strong argument in favour of the identity of this condition with beri-beri heart.

THEORETICAL CONSIDERATIONS.

It seems very probable that water-retention may be the primary cause of other manifestations of beri-beri and, in the first place, of the important degenerative processes in the whole peripheral nervous system. We have already seen that the swelling of nerve-endings in chicken beri-beri disappears completely a few hours after vitamin treatment. The microscopical anatomy of nerve-fibres and ganglion cells in beri-beri accords well with this conception, and it should not be forgotten that although motor and sensory paralysis may be found, as in polyneuritis, the primary affection of the nerve element in beri-beri is not inflammation. It is the general opinion that the anasarca is not so much secondary to heart failure, as essentially an imbibition process of the tissues. Other organs may show temporary swelling at the same time. Some of the glands seem to possess a special predisposition for this kind of water-retention in beri-beri, just as striated muscle is the first tissue to swell while smooth muscle escapes. A familiar pathological finding in this disease is swelling of the mucous lining of the gall-bladder. Kieviet de Jonge mentions a curious broadness of the face, recalling parotitis, and he found that there is enlargement of both parotid glands, the nature of which, he says, is "not œdema." Stepp thinks it probable that some of the glands, especially those secreting saliva, ceased to function.

It would be astonishing if beri-beri were the only disease in which water-retention directly damaged the heart. When an ailing heart does not react to heart drugs we generally suspect a desperate anatomical and functional condition of the myocardium; it seems possible that the cause found in beri-beri plays a part in the development of such events and might be removed by analogous forms of treatment. The first disease to remember in this connexion is myxœdema, where there is water-retention as a consequence of insufficient thyroid secretion (" Quellung "), and where water is expelled (" Entquellung ") by thyroid treatment. A case of atypical myxœdema may be shortly related here:—

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[1] Japan Jour. of the Med. Sciences, 1927, viii.

[2] Virchow's Archiv, 1928, p. 267.

Some 20 years ago a small Frisian community sent a poor man to the medical clinic in Groningen because he was more or less stupid and so easily tired that he was incapable of any bodily work. His face showed a certain degree of imbecility or apathy, and his muscular function was greatly diminished; but his build was Herculean. There was no trace of œdema, the face was not swollen, and the heart seemed normal. The muscles were not only big, but very hard and of abnormal consistence; I thought this might be myxœdema of uncommon localisation. A few thyroid tablets had a most astonishing effect; the firm voluminous muscles that were very painful on pinching became thinner, softer, and fit for use again. On palpation the peculiar sensation of rolling muscle bundles returned, leaving only a few hard nodes, which disappeared in a day or two. In a week's time the normal intellect of the man had returned and he was sent back to his village and advised to take small doses of thyroid indefinitely. To the great satisfaction of his community he proved completely cured and able to do regular work, but with less Herculean muscles.

The absence of heart and nerve lesions, on the one hand, and the inactivity of thyroid in beri-beri on the other, prove that this case was not beri-beri, and the two conditions of different nature.

Another important difference was noted by Aalsmeer. In both diseases there is a greatly increased skin-resistance in the patient to the electrocardiogram; more in beri-beri than in myxœdema. But the deflections of the string are very small in myxœdema and at the least normal, or sometimes much larger than normal, in beri-beri.

These clinical facts point to the quite peculiar and specific nature of the swelling of the striated and heart muscle, which is certainly not a condition of œdema.

HEART HORMONES AND AUTOMATINS.

Our subject forms a bridge between scientific research at the bedside and modern experimental work on heart " hormones " (Haberlandt) and " automatins " (Zwaardemaker). Rigler[3] found that vitamin B, isolated as a pure chemical substance by Jansen and Donath, belongs to this group of substances. He believed it to be identical with histamin. The fact that the organism itself produces substances which are able to bring an experimentally stopped heart and its automatic functions back to life has already induced experimental workers to recommend these substances for the treatment of heart patients. The beri-beri heart shows that at least in some rare conditions the revival of a seemingly lost heart is possible. There are doubtless a great number of different conditions causing standstill of the heart, and doubtless we shall hear, in the course of time, of a great number of different substances which may help. The beri-beri heart shows that not every heart that stops its systolic action has lost its regular automatic vital function. The automatism may go on undisturbed, but is prevented from manifesting itself by lack of conductivity or, as in beri-beri, by interference with contractility. In such cases the active substance which restores the regular function should not be called an automatin; what happens in the heart is not revival from death, but release from bondage.

SUMMARY.

My subject shows eloquently that careful study of the sick and their symptoms, and free experimental research are equally indispensable to the advancement of medicine.

It teaches us the existence of a law of circulatory correlation between the left and the right heart, working along simple mechanical lines of considerable clinical importance.

It leads us towards the better understanding of a disease, of which the successful treatment had already been found by experience at the bedside.

It brings us into close contact with the most modern biological problems of water exchange, of hormones, of sudden death, and revival of vital functions.

It seems permissible to formulate the hypothesis that the fundamental process in beri-beri is water retention and the consequent swelling of certain vital tissues, especially nerve and striated muscle.

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[3] Med. Klinik, 1928.

THE LATER RESULTS OF PARTIAL GASTRECTOMY.*

By NORMAN C. LAKE, M.D., M.S., D.Sc. Lond.,
F.R.C.S. Eng.,

SURGEON TO CHARING CROSS AND BOLINGBROKE HOSPITALS; ASSOCIATE EXAMINER IN SURGERY, UNIVERSITY OF LONDON.

FEW subjects have received more attention or have been the cause of intenser controversy during recent years than that of the nature and treatment of gastric and duodenal ulceration. From the surgical point of view the discussions have, for the most part, ranged around the relative merits of partial gastrectomy and gastro-enterostomy. It is not proposed in this article to consider partial gastrectomy as a treatment for new growths—for here the obligations of the surgeon are sufficiently clear—but to limit the review to cases of apparently non-malignant ulceration.

It will be well at the outset to summarise the standpoints taken by the several schools of thought at the present day. (1) The first school believe that operative treatment should never be adopted in the absence of acute complications such as perforation; they maintain that the symptoms can be adequately controlled by purely medical measures. For obvious reasons this group consists almost exclusively of physicians. (2) The second group comprises those who think that operation may be occasionally justified in very persistent cases, and especially in the presence of such complications as pyloric stenosis. Into this group fall many physicians and a few surgeons who have been unfavourably impressed by the recurrence of symptoms or the onset of jejunal ulceration after gastro-enterostomy. (3) The majority of English surgeons belong to the third group and favour gastro-enterostomy for chronic cases, after medical treatment has been given a trial, but would treat all acute cases medically. (4) Others advocate gastro-enterostomy, with or without pyloric exclusion, for practically all cases. (5) Yet another school consider that for the majority of cases of gastric ulceration partial gastrectomy is indicated, but perform gastro-enterostomy for duodenal disease. (6) The last school believe partial gastrectomy to be the operation of choice in all cases, and would always perform it for both gastric and duodenal ulceration if the technical difficulties are not insuperable.

With such diversity of opinion the only safe guide is a critical and, as far as possible, unbiased examination of the results. Since this article will deal only with the surgical aspect it is essential, as a prologue, to give reasons why the claims of the first school, that surgical treatment is unnecessary, cannot be entertained. Unfortunately, perhaps, for the surgeon's proper judgment, the great majority of the cases upon which he operates have already received a prolonged course of medical treatment, a circumstance likely to prejudice his opinion of these claims. The discovery of signs of old healed ulcers is offset by the presence of the fresh outbreak for which the operation is undertaken. The treatment therefore, even in such cases, has done little more than allow the original ulcer to heal without removing the cause. Post-mortem evidence of completely healed ulcers is, in my experience, much rarer than that found at operation for a fresh outbreak; it thus appears reasonable to conclude that medical treatment can rarely bring about permanent cure. Moreover, relief of symptoms is not necessarily accompanied by cure of the ulcer.

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* Being a paper delivered before the South-West London Post-Graduate Association.

The list of possible surgical procedures is a long one, and each operation has its advocates and indications. 1. Posterior gastro-enterostomy. 2. Anterior gastro-enterostomy. 3. Gastro-enterostomy with pyloric exclusion or entero-anastomosis. 4. Finney's operation. 5. Local excision by knife or cautery. 6. Local excision and gastro-enterostomy. 7. Sleeve resection. 8. Partial gastrectomy (Billroth 1 and 2; Polya and its modifications). 9. Jejunostomy. 10. Denervation. Of these only gastro-enterostomy and partial gastrectomy will be compared, the indications for the others falling outside the scope of this article.

Data.

The cases reviewed occurred in the author's practice during the five years 1922–27, and none of less than one year's post-operative history are included. The total number of gastric operations was 221, and of these 65 were partial gastrectomies and 71 gastro-enterostomies; the percentage of gastrectomies, however, rose from 5 per cent. in the first year to 62 per cent. in the final year under review. In the first instance inquiry was made by a circular letter including a series of simple questions designed to overcome any reluctance on the part of the patient to record unsatisfactory results; for previous experience had shown that patients hesitate to state slight inconveniences.

As many patients as possible were then personally interviewed and re-examined; plenty of volunteers were found for additional investigation by bismuth meal, test meal, blood counts, bacteriological tests, &c. In this way the subsequent history of a considerable number has been obtained in detail, with records of the ultimate results of the special tests. In classifying the results, those who, in addition to giving entirely satisfactory answers to the questions, added enthusiastic comments about their health, were called "satisfactory + +." Those who answered all questions in a gratifying manner without comment were classed as "satisfactory +." Where the patient had received complete relief of symptoms but complained slightly of occasional fullness and constipation the result was called "satisfactory." Patients who stated they were better but still had attacks were "unsatisfactory," while patients with recrudescence of symptoms or development of fresh ones were "unsatisfactory +." One of the questions related to the type of food taken, and unless the reply was that all foods were taken without restriction the patient was not placed in the "satisfactory" group. Of the 65 gastrectomies 8 were subsequently proved by section to be carcinomatous ulcers, and have therefore been placed in a separate table.

Partial Gastrectomies for Simple Ulcer (51).
Result in Percentages.

Sat. + +	76	95	Unsat.	2·5
Sat. +	19		Unsat. +	0
Sat.	2·5			

Partial Gastrectomies for Ulcers Proved Carcinomatous (8).

One died as result of operation and 2 subsequently of recurrence. Of the remainder 3 are satisfactory + + and 2 satisfactory +.

Gastro-enterostomies for Simple Ulcers (61).
Result in Percentages.

Sat. + +	45	51	Unsat.	21
Sat. +	6		Unsat. +	15
Sat.	12			

Thus 95 per cent. of the partial gastrectomies have no symptoms of any sort and are able to take all kinds of food without restriction, and 51 per cent. of the gastro-enterostomies come into the same category. Only 2·5 per cent. of the gastrectomies are unsatisfactory, but 36 per cent. of the gastro-enterostomies fall under this heading. There can be no doubt, therefore, that from the point of view of complete and permanent relief of symptoms gastrectomy is a much more satisfactory operation than gastro-enterostomy, although 63 per cent. of patients treated by the latter method are cured or improved.

The mortality figures rather counterbalance this satisfactory conclusion, for 6 of the gastrectomy cases died within four weeks of the operation, 2 of hæmorrhage, 2 of pneumonia, and 2 as the result of gastric fistula following the Billroth 1 type of anastomosis. Both these last two were debilitated patients with enormous ulcers (one malignant) very adherent to surrounding structures, and no other procedure seemed possible. The Billroth 1 operation is notoriously liable to leakage if there is the slightest tension on the anastomosis, which is difficult to avoid after an extensive resection. It is legitimate, therefore, to exclude these from the ordinary mortality. They come early in the series, and with additional experience it is certain that they would now either be left alone or treated by jejunostomy. The other four cases constitute a mortality of 6·3 per cent., a figure capable of reduction, probably to half, with care. On the other hand, there was no mortality in the gastro-enterostomy series. Further analysis of the mortality figures gives the following:—

	Per cent.		Per cent.
Gastro-enterostomy	0	Billroth 2	7·5
Sleeve resection	20	Billroth 1	100
Polya	0		

The 20 per cent. for sleeve resection is obviously misleading, as there were only five cases in the series and the death of one from hæmorrhage was due to the use of catgut subsequently found to be defective. According to these results the Polya would appear to be the safest type of gastrectomy, but the total number of each type performed must be taken into consideration.

Gastro-enterostomy without perforation	61	Polya	18
Sleeve	5	Billroth 2	40
		Billroth 1	2

Even then the Billroth 2 operation is found to have the greater risk, but there was no mortality when it was performed in two stages. The further statistics of the gastrectomy cases are as follows:—

Male, 46	Average age,	39	Incidence of carcinoma cases	13 per cent.
Females, 17	,,	44		12 ,,

The types and position of ulcers were: gastric (body) 12, gastric (pyloric) 5, duodenal 6, doubtful (pyloric) and not mentioned 21, multiple 6, jejunal 7, carcinomatous 8. This list only records the position of the chief ulcer and does not take any account of healed scars or other small ulcers. Had these been included the percentage of multiple ulcers would have been about 90.

After-results of Gastrectomy.

All the gastrectomy cases have gained weight since the operation, some of them as much as 3 st., and they all look remarkably healthy. In one or two cases there appears to have been an excessive deposition of fat, and two mentioned the development of an abnormal desire for highly spiced foods.

Practically all the cases had fractional test-meals carried out shortly after operation, and with one exception showed complete achlorhydria. Those taken after an interval of several years demonstrate quite conclusively that the achlorhydria is permanent. None of them showed the slightest trace of free hydrochloric acid. The average total acid was less than 10, and the average total chlorides in the absence of bile 29; when bile was present this rose to over 70. Typical examples are given in Figs. 1 and 4. Bismuth meals, also conducted after a long interval, show that the remnant of stomach undergoes considerable increase in size; emptying is rapid, never taking longer than an hour and usually much less. The stoma in the Polya and Billroth 2 operations lies more or less horizontally, and is fairly well defined in the radiograms. There is no radiographic evidence of any effect upon the movements of the small or large intestines.

Blood examination revealed a high count corresponding to the patient's appearance of health; no.

case showed less than 4,800,000 red cells. The average of all the counts gives—

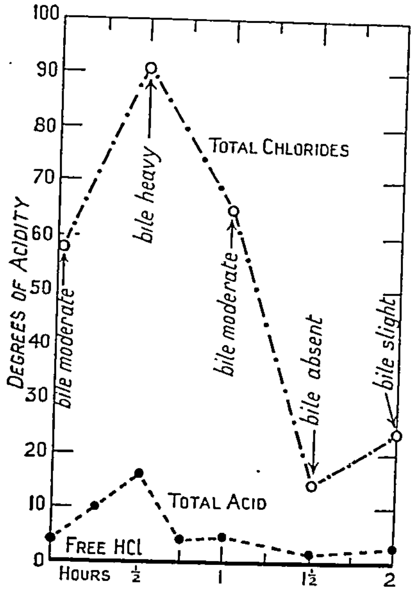
Red blood cells	5,250,000	Eosinophils	1·5 p.c.
Hæmoglobin	91·2 p.c.	Basophils	0·5 "
Colour-index	0·84	Large hyalines	5·4 "
White blood cells	7,160	Lymphocytes	30·4 "
Polymorphs	61·8 p.c.		

Bacteriological examination of the teeth, gums, tonsils, and throat in a series of cases yielded streptococci in several, but in no case were they hæmolytic.

The reasonable deductions from these statistics are that gastrectomy gives much more satisfactory ultimate results than gastro-enterostomy; that it has a mortality of about 7 per cent., whereas there is no mortality from gastro-enterostomy; that jejunal ulceration does not occur after gastrectomy, whereas a proportion of the gastro-enterostomies have symptoms suggestive of such ulceration, and subsequent gastrectomy has sometimes been necessary for definite jejunal ulceration. The exact incidence of jejunal ulceration in the gastro-enterostomies is uncertain because some cases with suggestive symptoms have not been explored, but if we include these the percentage is over 10. The gastrectomies include a large percentage of the more difficult and serious cases with extensive ulcers penetrating surrounding structures, while the gastro-enterostomies include most of the cases of simple duodenal ulceration where the operation was easy.

The total number of jejunal ulcers is too small to allow any definite conclusions, but the accepted idea, that they occur more frequently after duodenal ulceration, is supported, while excision of the original ulcer at the time of operation appears to make no difference to their incidence. Some competent observers deny that jejunal ulceration is rare after gastrectomy, and also state that its incidence is as high after gastro-enterostomy in those cases that show no post-operative acid as in those where acid remains high. There are objections to both these arguments against the importance of hydrochloric acid in the ætiology of jejunal ulceration. It has been definitely established that some patients were not achlorhydric after gastrectomy owing to the very limited resection performed, often little more than a pylorectomy. In the author's experience those cases of gastro-enterostomy which show little or no acid after operation will be found to have had very little acid to start with; this usually means that the ulceration is almost always multiple and of long duration, with the development of a secondary atrophic gastritis (Fig. 2). Under these circumstances the anastomosis may actually be made at the site of mucous ulceration, a condition which would naturally predispose to the development of jejunal ulcer. It will also be obvious that unless the total chlorides are estimated it is impossible to state whether the achlorhydria is due to neutralisation or lack of secretion. In the former case there is no guarantee that the test-meal is an accurate indication of the acid content (or its absence) after ordinary diet.

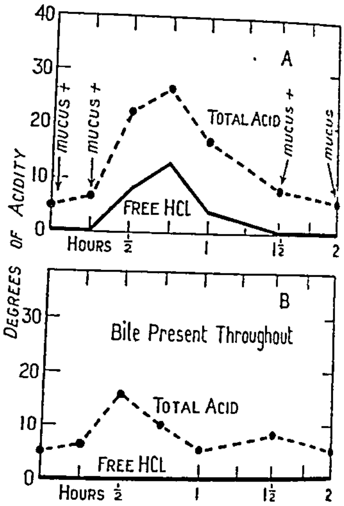
FIG. 1.



Test-meal after partial gastrectomy. The effect of the presence of bile upon the total chlorides is well seen.

If it be agreed that the results of partial gastrectomy are much better than those of gastro-enterostomy, the following questions arise: 1. Is the mortality of partial gastrectomy justifiable? 2. Are the results permanent? 3. Are there any remote effects of the removal of large portions of the stomach? 4. In what way does gastrectomy act?

FIG. 2.



Curves obtained before operation (A), and after operation (B), in a case of prolonged multiple gastric ulceration with atrophic gastritis, showing the small acid content before operation (gastro-enterostomy with cauterisation of the ulcer). The achlorhydria is chiefly due to neutralisation, which would probably not be so complete after an ordinary meal.

The Alleged Deleterious Results of Gastrectomy.

In the series under review the oldest cases have more than six years' post-operative history, while quite a large proportion have more than three years. It may be doubted whether even these periods constitute a true test of permanency, especially since many cases of jejunal ulceration after gastro-enterostomy do not become urgent for many years (certainly more than ten). Nevertheless most patients complain of premonitory symptoms within a limited time (usually a few months) of the operation, whereas the gastrectomy cases all express themselves as entirely free of any warning symptoms. Their general state of health, too, is patently incompatible with continued ulceration. It may be accepted, therefore, as the result of actual experience, that the good results obtained are permanent in the practical application of that term.

It has often been suggested that untoward remote effects may follow partial gastrectomy, especially as all the cases have complete achlorhydria. The relationship of achlorhydria to pernicious and other anæmias has been thought by some to be one of cause and effect; for this reason the blood examinations made some considerable time after the gastrectomy are particularly interesting. No case shows any sign of primary anæmia, but the hæmoglobin and colour-index are rather below normal; the total leucocyte count is normal, the polymorphonuclears being perhaps slightly low. It can therefore be stated with confidence that this series affords no evidence of any deleterious effect of achlorhydria upon the blood count. (Cases of malignant ulceration must obviously be excluded; some of the discrepant results obtained in the past may possibly be explained by failure to separate malignant and simple cases.) No patient is known to have died since the operation, so that any subtle intangible lowering of the resistance to other diseases, especially infections, can be excluded. The stools were not examined bacteriologically, but there were no clinical signs of any abnormal infectivity of the intestinal contents, nor was there any radiographic evidence of nervous or chemical interference with the action of the small or large intestine.

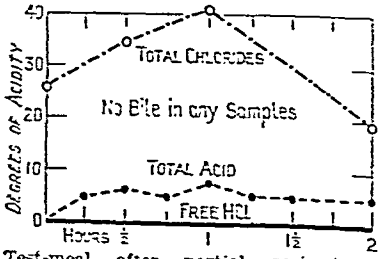
The tendency to excessive deposition of fat in two cases could conceivably be due to some alteration in the metabolism of food, but is probably more correctly explained as an inability of the tissues, often long starved, to deal efficiently with the sudden excess of food products with which the patient, now relieved of his pains, supplies them. In other cases it may be merely the resumption of the patient's normal build and habit. The slight qualitative change in appetite reported by two patients may be due to the removal of a large sensory area from the stomach mucosa, but was too vague and trivial to warrant much attention.

On the whole, then, it seems that there is not an iota of evidence that any remote deleterious effects follow gastrectomy. Indeed, the patients appear to be in a much better general state of health than they had been for many years.

The Mortality of Gastrectomy.

The definite, if small, mortality associated with gastrectomy cannot be dismissed so easily. In this series the gastrectomies include all the most difficult cases, while the mortality associated with any subsequent operation for jejunal ulceration (notoriously difficult to treat and usually demanding partial gastrectomy under the worst circumstances) should be remembered in estimating that of gastro-enterostomy. With these modifications the difference in the mortalities is much reduced, some say equalised. All discussions of mortality are, however, futile until the type of case for which the operation is to be limited is defined. Those who recommend gastrectomy for all cases of duodenal and gastric ulceration agree that the mortality is little greater than that of gastro-enterostomy with its later complications; those who limit the operation to large gastric ulcers state correctly that such conditions are very serious at the start and that, provided the mortality is small, the operation is amply justified. The mortality is capable of further reduction; probably the surgeon's experience is the most important factor, but greater pre- and post-operative care are possible. Transfusion, special dieting, attention to oral sepsis, and especially the postponement of operation upon any signs of infection of throat or lungs should never be neglected. In all serious cases the operation should be a Billroth 2, performed in two stages with a suitable interval.

FIG. 3.

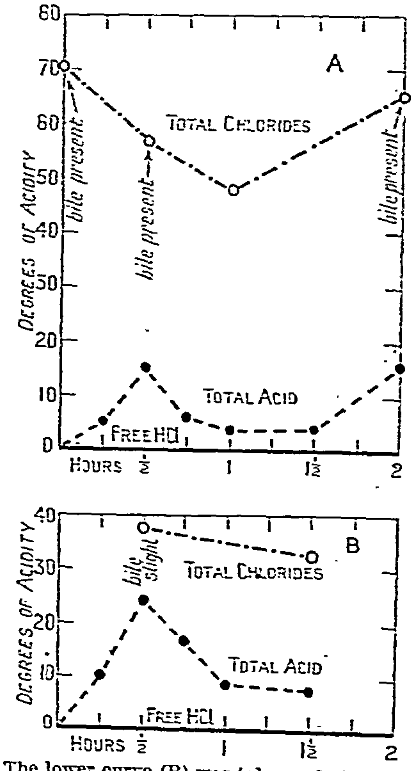


Test-meal after partial gastrectomy, showing achlorhydria and low total chlorides in the absence of bile, indicating that achlorhydria is not merely a question of neutralisation.

After the operation every precaution must be taken to prevent chest complications. The value of extensive splanchnic and field block anæsthesia is doubtful; it was used in a large percentage of these cases without any effect upon the incidence of chest complications, though it probably rendered the convalescence smoother. In most cases the general anæsthetic was intratracheal ether or chloroform, and there was no noticeable difference in the effects upon the lungs. There is no doubt that post-operative "pneumonia" in these cases is due much more to the lowering of vitality and interference with upper abdominal movement than to the type of anæsthetic, so that speed, facility of access, and clean, gentle manipulation are of great importance. The other causes of mortality are definitely avoidable by attention to technique, and there is no reason why it should rise above 2 or 3 per cent. If such a figure be approached there can be no doubt that the operation is not only justifiable but actually advisable instead of gastro-enterostomy.

Among other arguments in favour of gastrectomy is the avoidance of the risk of subsequent malignant change in the ulcer. Some cases not included in this series definitely prove that such a change can occur, even after gastro-enterostomy, but it is certainly uncommon, and the high percentages given by some observers are undoubtedly founded upon a misinterpretation of the premises necessary to establish a diagnosis of malignancy. If malignant change were common, any series of gastro-enterostomies should show a fairly large subsequent mortality from this cause; even if it be assumed that gastro-enterostomy largely prevents malignant changes, a percentage of the cases will be unknowingly malignant when operated upon. The cases of carcinoma included in this series were for the most part only definitely diagnosed microscopically after removal. The conclusions are: (1) that malignant change can occur in ulcer, although it is probable that the majority of carcinomata start de novo; (2) that a certain number of cases, apparently of ulcer, will be found definitely malignant upon microscopy. These are obviously arguments in favour of gastrectomy, but neither event is common, and I would not stress them.

FIG. 4.

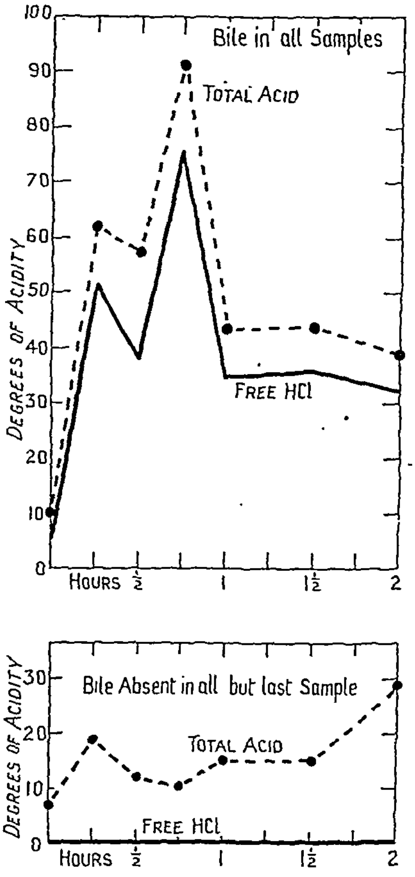


The lower curve (B) was taken a fortnight after partial gastrectomy, whilst the upper curve (A) was obtained two years later. It shows the permanency of the type of curve.

How Gastrectomy Acts.

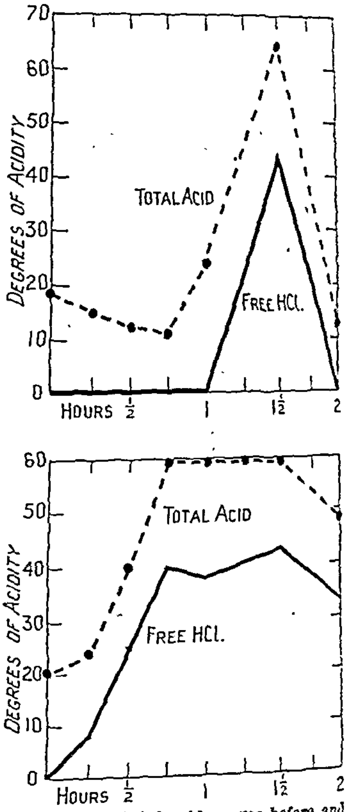
The limitation of ulcers to the pyloric region is marked, but not absolute, while the fact that jejunal ulceration occurs after short-circuiting shows that gastrectomy is not simply the removal of an ulcer-bearing area. Hyperchlorhydria has long been accepted as an important ætiological factor in the production of ulceration, and there is at least some association between the two. Accordingly it is assumed that gastro-enterostomy produces its effects by neutralising the acid with the alkaline contents of the jejunum. The post-operative test-meal curves show positively that there is an essential difference between the effects of partial gastrectomy and gastro-enterostomy. The gastro-enterostomies show merely a reduction in acidity (Fig. 5), while the gastrectomies reveal complete absence of free hydrochloric acid. This is not simply due to more effective neutralisation, for the total chloride is always very low in the absence of obvious bile or mucus (Fig. 3). This raises a point of some importance in the physiology of the stomach, for it can only be explained by assuming: (1) that the pyloric half of the stomach is the only portion capable of secreting acid—this is at variance with ordinary physiological teaching; (2) that the operation so profoundly modifies the general activities of the stomach, either by nervous reflex or locally, that the remaining cardiac half permanently ceases to secrete acid. Recent work upon the control of secretion, the secretion of neutral chlorides, and the effect of duodenal regurgitation has amply shown that the whole question is much more complicated than was *formerly believed; I hesitate, therefore, to draw* dogmatic conclusions upon what may easily prove to be inadequate data. Whatever the laboratory findings, *however, these clinical facts demand recognition and* critical examination. The fact that where the whole of the pyloric half was removed, no matter how much of the cardiac portion remained, *complete achlorhydria* resulted, while cases of limited pylorectomy (not included in this series) revealed in every instance merely reduction of acid, seems to prove that the results cannot be dismissed as erroneous or fortuitous. That the removal of varying amounts of the pyloric end would so consistently and permanently affect the secretion from the cardiac end scarcely appears feasible, but the rate of emptying of such a stomach is very rapid, and MacLean has recently shown that "the gradual decrease in acid concentration in the stomach during the completion of ordinary digestion in normal dogs is a function of the stomach itself, and in no way dependent upon regurgitation of alkaline duodenal contents." It may be that the absence of secretion is also an intrinsic "function" of the stomach when its general physiology is disturbed by the performance of a gastrectomy. A nervous reflex effect is excluded by the fact that sleeve resection, in which *the division of nerves is almost* as extensive as in the usual partial gastrectomy, is not followed by achlorhydria. The same applies in greater degree to definite denervation operations of which a typical post-operative curve is given (Fig. 6). The simpler suggestion—i.e., that the acid-*secreting portion is removed*—is probably the correct one. The physiological teaching with which this disagrees is chiefly founded upon experimental work on dogs, *the results of which should* only be applied with great reservation to human beings. The histological evidence of the presence of acidophile cells in the cardiac glands is also inconclusive, for it may be argued that the cytoplasm of a cell secreting acid would be left on the alkaline side of neutrality. The *intimate physiology* of these cells is not sufficiently understood for us to deduce the exact chemical changes which occur in the cytoplasm. A test-meal after partial gastrectomy is not without difficulties and uncertainties, and the *results may be due to the collection of material from* the jejunum rather than the remaining stomach. The characteristic curves given here, especially the effect of bile *upon the total* chlorides, and the general uniformity of results over a series of cases, suggest, however, that they are not the result of technical errors.

FIG. 5.



The upper curve was obtained 16 years after performance of posterior gastro-enterostomy, and shows that despite admixture of bile the free acid still remains high. At operation the pyloric ulcer was found to penetrate surrounding structures: the whole pyloric end of the stomach, including the anastomosis, was excised, and a fresh Polya type of anastomosis was performed to the cardiac end. *The lower curve shows the resultant achlorhydria, occurring despite absence of bile.* These curves demonstrate the profound difference between the effects of gastro-enterostomy and gastrectomy.

FIG. 6.



Free HCl and total acid curves before and after denervation of the stomach, showing no reduction in free acid but alteration in general character.

Those who believe that hydrochloric acid bears an ætiological relationship to ulceration find in this result a ready explanation of the success of partial gastrectomy. The growing school, however, who regard acid and ulcer as concurrent effects of an unknown cause will still be at a loss. On the whole, the evidence derived from these cases of gastrectomy is rather in favour of reinstating acid as an important ætiological factor which may, of course, be, and indeed probably is, itself secondary; for not only is the abolition of acid the most conspicuous result of the operation, but the *rarity of subsequent jejunal* ulceration is also best accounted for in this way. (Some believe that this result is due to the removal *with the original ulcer of the* possibility of infection of the suture line. As we have already seen, however, excision of the ulcer with *gastro-enterostomy is not followed by immunity.*)

The activity of pepsin is commonly ignored in considering the ætiology of ulceration, largely on account of the difficulties of quantitative estimation of enzymes, but it would probably be *more accurate* to use the term "*pepsin* hydrochloric acid" in place of plain "hydrochloric acid" throughout. The idea that the pyloric end of the stomach *is responsible* in man for the production of acid deserves the attention of physiologists. It certainly fits in *satisfactorily* with the division of the stomach into two functionally separate portions, a view supported to some extent by morphology and by radiology, the cardiac end being *considered* merely as a storehouse for food taken intermittently at meals, from *which the actively* digestive pyloric end is slowly and continuously supplied with pabulum.

Predisposing Conditions for Ulceration.

There has, in the past, undoubtedly been too great a tendency to think of gastric and duodenal ulceration as a local isolated lesion, a tendency which is reflected in the embolic theory and others where the microscopic anatomy of arterial distribution is held responsible. Careful examination of the ulcerated stomach or duodenum shows the great frequency of multiple ulceration, of the recurrence of ulceration at fresh sites, and of healed ulcers. These findings are especially important when founded upon the investigation of the parts removed by gastrectomy, or even better when seen in the live subject through a gastroscope (an instrument which the author has frequently used in these cases), for there can then be no suspicion of post-mortem effects. It is not going too far to state that almost all cases with prolonged histories afford evidence of multiple ulcers, either active or healed. We are not dealing with a lesion of local origin but with some condition of the stomach which predisposes to ulceration, and of which the ulcer itself is but a manifestation. The occurrence of jejunal ulceration after gastro-enterostomy for ulcer, and its absence after the same operation for carcinoma, favour the view that the contents of the stomach are responsible. The limitation of duodenal ulceration to the first portion, where it is exposed to the stomach efflux, may be also evidence (admittedly equivocal) of the importance of the contents. Yet the distinction between wall and content is not perhaps so great as it may seem, for the content is made up of two parts—the ingested food and the added secretion from the wall. The evidence given in this article, although incomplete, is in favour of a change in the contents as the exciting cause of ulceration, and this can conceivably be brought about (1) by changes in the nature of the secretion, and (2) by changes in the food taken. Once again we meet the relationship between pepsin hydrochloric acid and ulcer, for increase of acid secretion is the most constant and conspicuous change in the contents. Why a stomach should secrete these materials in excess is difficult to see; some authorities, on the evidence of test-meals, deny that they are in excess, but the ordinary test-meal only estimates the strength and not the quantities of acid secreted. When all the clinical and experimental work is examined it must be admitted that the association between the two is so close as to resemble cause and effect. Change in secretion, both quantitative and qualitative, is experimentally produced by alterations in the nature of the ingested food. The classical work of Pavlov showed that there is a psychical as well as a direct secretion, the former being stopped by nerve section. The importance of the psychical secretion in man is difficult to estimate, but it may be the secret of the alteration in gastric secretion. It is certainly intriguing, and perhaps not wholly fantastic, to assume that the flagging appetite of civilisation, with its sedentary occupations and economy of manual labour, is abnormally stimulated by the consumption of highly flavoured and spiced foods with the plentiful addition of condiments. These substances, including the extractives, are known experimentally to produce a copious psychical secretion of gastric juice. Pepsin hydrochloric acid may therefore be produced in large excess of that likely to be absorbed by the meagre quantity of food taken. The acid curves after the usual test-meal of gruel are not those which might be expected to follow the ingestion of a full meal, nor would it be at all easy to estimate the free acid in such a complicated mixture. Duodenal ulcer is said to be commoner among sedentary workers, and the symptoms are particularly prone to recrudescence during periods of mental strain and anxiety when the appetite fails; the same may be said of the symptoms attributed to hyperchlorhydria without ulcer formation. This theory assumes that the stomach is constantly being deceived into producing more secretion than is needed, and in the course of time develops the habit of excessive response. The success claimed for denervation operations may be partly due to the abolition of psychical secretion, although simultaneous cutting-off of the motor control and sensory supply renders definite conclusions impossible. The post-denervation test-meal curve given here shows little change, but of course it makes no pretence of representing the psychical secretion. If the habit of hypersecretion ultimately becomes an intrinsic function of the stomach denervation would produce little effect in established cases. So little is known, however, of the nervous control of the stomach in man and of the effects of denervation that it would be unwise to dogmatise.

Summary.

Ulceration should be regarded as a local incident in a much more fundamental general change in the functions of the stomach. This change, however produced, leads to the secretion of an excess of pepsin hydrochloric acid which may be regarded as the direct exciting cause of the ulceration. The acid may, in an uncertain and irregular fashion, be somewhat reduced by gastro-enterostomy; it can only be abolished by removal of the pyloric half of the stomach. Partial gastrectomy is the only operation which removes the cause of the ulceration in the majority of cases and which can be trusted to result in permanent cure. (Some may object to the use of this word when the affected part is excised.) This conclusion is amply borne out by the details given in this paper. The author has not quite enough courage in his convictions to subject to partial gastrectomy all cases of gastric and duodenal ulceration at whatever stage, but treats early cases upon medical lines in the hope that some change may thus be effected in the secretory activities of the stomach. In cases of simple duodenal ulceration of short history a partial gastrectomy appears unnecessarily severe when a safe gastro-enterostomy so frequently relieves the symptoms. This is perhaps not illogical, for in such cases the acid content is not always high and may therefore be sufficiently reduced by partial neutralisation. If the pre-operative test-meal reveals a high acid content it is probably wise, even in these cases, to perform a partial gastrectomy and so escape further ulceration, perhaps in the jejunum. For all other cases partial gastrectomy is the operation of choice, and, if the presence of adhesions, penetration of ulcer, or difficulty of access will obviously render the operation a difficult and dangerous one, the possibility of anastomosis of jejunum with the cardiac half of the stomach and the resection of the pyloric end at a subsequent operation, as in the Billroth 2 method, should be seriously considered. In this way an operation, otherwise serious, may be rendered comparatively safe. Where gastro-enterostomy has already been performed without relief of symptoms, partial gastrectomy holds out a very good hope of cure; indeed some of the most gratifying cases in the series come into this group. In the absence of jejunal ulceration it is sometimes possible to utilise the gastro-enterostomy aperture, the pyloric end being excised as in the Billroth 2 operation. Where the original anastomosis has been performed towards the pyloric end, or where jejunal ulceration is present, the whole is excised with the stomach and a fresh anastomosis made, usually by the Polya method. The former is a very safe procedure, but the latter may in some difficult cases demand the utmost dexterity and care.

Ulcers in the cardiac half of the stomach are not so uncommon as is sometimes thought. Where the ulcer is capable of local excision, without danger, this should be done, combined immediately or subsequently with partial gastrectomy. Where the ulcer cannot be excised removal of the pyloric end is nevertheless indicated. This method of treatment has been adopted in several cases with complete relief of symptoms, and definite radiographic evidence of cure of the ulcer.

No reference has been made to the actual cause of the pain, since this is outside the scope of the article. If, as is probable, it is due to irregular muscle tension and abnormal intragastric pressure (in the absence, of course, of penetration of surrounding structures), a partial gastrectomy must correct both, as it produces immediate relief of symptoms. Relief of symptoms, however, does not necessarily imply cure of the ulcer, as shown by the cases of hæmorrhage and perforation which occur after gastro-enterostomy has produced complete relief of symptoms. For this reason special emphasis has been laid here upon the actual cure of ulceration and prevention of recurrence rather than upon the mere relief of symptoms.

I wish to acknowledge my indebtedness to Mr. E. Crook, surgical registrar, Charing Cross Hospital, who has taken infinite pains in the collection of the statistics and the carrying out of post-operative inquiries; to the staff of the Institute of Pathology for their chemical (Dr. J. Patterson) and pathological (Dr. A. B. Rosher and Dr. Berry) investigations, and to Dr. Russell Reynolds and Dr. Cochrane Shanks for the radiographic work.

THE STANDARDISATION OF SCARLET FEVER ANTITOXIN

BY CLINICAL METHODS.

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THERE are four methods in use for the standardisation of the scarlatinal streptococcic toxin and antitoxin. Three of these are clinical tests for which the human volunteer is necessary; the fourth is a method, recently described by Parish and Okell, which tests the potency of scarlatinal antitoxin in protecting rabbits against the intravenous injection of whole cultures of *Streptococcus scarlatinæ*. Laboratory animals are relatively insusceptible to the toxin of *S. scarlatinæ*, and this last method, while it serves to "differentiate efficient therapeutic sera from inefficient," lacks the accuracy with which the dosage of diphtheria antitoxin, for example, may be estimated. Whereas 0·002 c.cm. of diphtheritic toxin is an average lethal dose for a guinea-pig, 20–40 c.cm. of scarlatinal toxin, representing 500 times the quantity of toxin which will produce the scarlatinoid syndrome in man, are required to kill a rabbit. Nevertheless, any laboratory method which may compete in accuracy with the clinical tests for the standardisation of scarlatinal antitoxin must be the method of choice for various reasons. The tests can be carried out by competent technicians in the laboratory where the toxin and antitoxin is being prepared; the supply of animals is not limited like the number of human volunteers, and the individual variability is probably much less in the rabbit than in man.

The three clinical methods by which standardisation of scarlatinal antitoxin may be attempted are: (1) by the utilisation of the Schultz-Charlton phenomenon; (2) by passive immunisation; and (3) by the so-called skin method. It is proposed to give a short description and discussion of the results obtained from the use of these methods, and to discuss shortly their relative merits and limitations.

The Schultz-Charlton Test.

The serum of an individual convalescent from scarlet fever, or artificially prepared scarlatinal antitoxin, injected into the skin of scarlet fever patients while the rash is still bright, causes a blanching of the skin at the site of injection. In the application of this phenomenon to the diagnosis of scarlet fever (using a 1 : 10 dilution of antitoxin) a positive reaction is evidence of scarlatina, but a negative result does not quite exclude the infection, since some scarlet fever rashes are not blanched. Moreover, the test is least reliable where its use is most indicated—namely, in faint and otherwise atypical eruptions. It has, however, a useful application in the standardisation and comparison of scarlatinal antitoxins.

Method.—In the performance of the test dilutions of 1 : 1000 to 1 : 32,000 of the sera were used, since an antitoxin which does not cause blanching in a dilution of 1 : 1000 is of little therapeutic value. Children of 5 to 15 years with bright finely punctate rashes gave the best results; the abdomen is the most suitable site for the tests, and 0·4 c.cm. of the serum dilution was found to be an appropriate dose for injection. Usually four tests were done on each patient: two different antisera were compared, and two dilutions of each were used. If, for example, a dilution of 1 : 4000 but not 1 : 8000 of antitoxin A causes blanching, and a dilution of 1 : 8000 of antitoxin B causes blanching, the antitoxins can be standardised, and it is established that serum B has double the therapeutic value of serum A. Two sera S.A. 4571 and S.A. 4462 in dilutions of 1 : 1000, 1 : 8000, and 1 : 16,000 were tested. Antitoxin S.A. 4571 gave uniformly positive reactions in dilutions of 1 : 1000 and 1 : 8000, but two only out of eight cases tested were positive with a dilution of 1 : 16,000. S.A. 4462 produced blanching in a dilution of 1 : 1000 with all cases, but only four out of sixteen and none out of eight patients when tested with dilutions respectively of 1 : 8000 and 1 : 16,000 gave positive reactions.

Passive Immunisation.

To standardise and compare antitoxins by the passive immunisation of susceptible subjects one of two methods may be adopted: either (*a*) find the smallest dose of antitoxin which will render a Dick-positive reaction Dick-negative in 24 hours in a patient accidentally exposed to the risk of infection; or (*b*) determine the duration of immunity conferred by the injection of a standard amount of the antitoxin. The second method was used: 2·5 c.cm., 5 c.cm., *and in a few cases 10 c.cm. of the serum* was injected intramuscularly into patients who had given definite Dick-positive reactions; these individuals were then Dick-tested at regular intervals of time (24 hours, 5, 8, 13 days), until they again became Dick-positive. For comparison of the two antitoxins, the test-subjects were as far as possible children of the same age, giving Dick reactions of equal intensity. Even then, a lack of uniformity in the results may be expected, for the amount of scarlatinal antitoxin already present in the blood is probably not the same for any two individuals. For instance, the injection of 5 c.cm. of antitoxin may protect one child for two weeks, while an equal amount of the same antitoxin may protect another child with less natural antitoxin for one week only.* Table I. briefly summarises the results obtained.

TABLE I.—*Duration of Immunity with* (A) *2·5 c.cm. and* (B) *5 c.cm. Antitoxin.*

1. *Antitoxin A.4501.*

A				B			
Cases.	Time after inject.	Dick pos.	Dick neg.	Cases.	Time after injec.	Dick pos.	Dick neg.
16	24 hrs.	1	15	8	24 hrs.	0	8
	5 days.	2	14		5 days.	0	8
	8 „	11	5		9 „	3	5
	12 „	16	0		13 „	6	2
					17 „	7	1

2. *Antitoxin A.4462 E.*

A				B			
16	24 hrs.	0	16	14	24 hrs.	0	14
	5 days.	4	12		5 days.	0	14
	8 „	14	2		9 „	4	10
	12 „	16	0		13 „	11	3
					17 „	14	0

The Skin Method.

The test subjects for this method of standardisation must be, as in the passive immunisation method, susceptible to scarlet fever, and must give a Dick reaction of at least 20 mm. diameter with five skin-test doses of toxin. In hospital, patients convalescent from diphtheria and chicken-pox, and accidentally exposed to the risk of infection, were found most suitable for the purpose.

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* *The utility of passive immunisation in affording immediate protection to susceptible individuals exposed to scarlet fever* has been discussed elsewhere (Cruickshank, Glasg. Med. Jour.). It may be said that in general 2·5 c.cm. of a concentrated antitoxin protects for 3–6 days, 5 c.cm. *for* 7–10 days, and 10 c.cm. *for 2–3 weeks.*

Method.—Measured volumes of the toxin diluted to contain ten skin-test doses in 0·2 c.cm. were mixed in vitro with equal quantities of antitoxin in dilutions of 1 : 100 to 1 : 1000. After standing at room temperature for one hour, 0·2 c.cm. of these toxin-antitoxin mixtures—each containing five skin-test doses of toxin—was injected intradermally; a control test with toxin alone was also done. The mixture which reduces the reaction from 20 mm. in size to less than 10 mm. contains sufficient antitoxin to neutralise five skin-test doses of toxin. The "therapeutic dose"—the amount of antitoxin required to neutralise 20,000 skin-test doses of toxin (Dick and Dick)—can be readily calculated. Two sera, S.A. 4627 and S.A. 4565, were compared. The preliminary dilutions were made with graduated 1 c.cm. pipettes, a separate pipette being used for each antiserum and for the toxin, and again separate syringes were used for the intradermal injection of the different mixtures. The abdomen is the site of choice, since half a dozen or more tests can be done simultaneously and the reactions are more definite and measurable there than on the arms.

The results given in Table II. indicate that the "neutralising" dilution of antitoxin is 1 : 100.

TABLE II.—*The Skin Reaction to the Intradermal Injection of Toxin plus Varying Dilutions of Antitoxin.*

Size of Reaction in mm. Measured in Two Diameters.

Dilution of antitoxin.	S.A. 4627.		S.A. 4565.		Toxin control. 24 hrs.
	24 hrs.	48 hrs.	24 hrs.	48 hrs.	
1 : 1000	26 : 31*	30 : 33	16 : 20	25 : 25	32 : 40
1 : 800	17 : 23*	17 : 17	14 : 17	17 : 19	21 : 26
1 : 400	15 : 23*	18 : 23	10 : 13	15 : 21	24 : 27
1 : 200	14 : 17*	22 : 25	11 : 16	17 : 17	34 : 37
1 : 100	—	15 : 15†	20 : 22†	20 : 25†	27 : 33

* Each of these figures represents the average of four separate reactions on four children.

† With 1 : 100 dilution of antitoxin only one case showed any reaction with both S.A. 4627 and S.A. 4565.

Discussion.

None of the three clinical methods under consideration gave results that were sufficiently delicate and uniform to merit recommendation as an accurate and reliable method of standardising scarlatinal antitoxin. This might a priori be expected, since the human subject varies within wide limits in his response to infection; the variation, where scarlet fever is concerned, is probably due, in part at least, to the variable amount of natural antitoxin in the blood of different individuals. The difficulty could be surmounted by taking the average of a large number of individuals, but unfortunately the supply of human volunteers is limited.

In a comparison of the tests, preference must be accorded to that method which is the most delicate and at the same time gives uniform results. In other words, a method which will distinguish between the neutralising power of dilutions of 1 : 100 and 1 : 200 of an antitoxin, or between the antibody content of 2·5 c.cm. and 5 c.cm. of a serum, is preferable to a method which can only tell us that a dilution of 1 : 100 is more potent than one of 1 : 400 or 1 : 800, or that 10–20 c.cm. of a serum contains more antibody than 2·5 c.cm. The tables show that the results obtained by passive immunisation best fulfil the requirements, provided that the Dick test be repeated at four- to five-day intervals. Taking antitoxin A.4162E (Table I.). for example, if the patients were Dick-tested only 24 hours after injection of the serum it would be impossible to distinguish between the protective values of 2·5 c.cm. and 5 c.cm., but eight days afterwards, 14 out of 16 individuals receiving 2·5 c.cm. were again Dick-positive, compared with four only out of 14 receiving 5 c.cm. of antitoxin. Unfortunately the passive immunisation method requires a prolonged observation of the test subjects with repeated Dick tests, and, in addition, the injection of serum, which may not be without attendant risks in a sensitised individual. The Schultz-Charlton test can be carried out only on patients with bright scarlatinal rashes. Apart from the small percentage of cases which fail to react to the test, the method gives results which are fairly uniform and delicate.

The skin method, in our hands, failed to differentiate a dilution of antitoxin of 1 : 800–1 : 1000 from a dilution of 1 : 200, so that on the standard of delicacy it failed. The method has certain advantages, however, in that it is fairly easy, the tests are done on susceptible subjects, who require to be under observation for two days only, and the results obtained were more uniform and clean-cut than with either of the two previous methods. It is the method recommended by Dick and Dick, and has been adopted as the official method of standardising scarlatinal antitoxin by the Hygienic Laboratory of the United States Public Health Service.

If these clinical tests be compared with the laboratory test of Parish and Okell, they appear to have some advantage in the differentiation of the relative therapeutic values of scarlatinal antitoxins, but the drawbacks to the clinical tests are such as to give the laboratory test the preference as the method of choice. It must not be supposed, however, that any of the methods at present available is sufficiently accurate to allow a uniformity in the dosage of scarlatinal antitoxin in any way approaching that of diphtheria antitoxin.

I am indebted to Dr. R. A. O'Brien, of the Wellcome Physiological Research Laboratories, for suggesting this piece of work and for advice throughout its course. Most of the material was supplied directly by him.

References.—Cruickshank, R.: Glasg. Med. Jour., 1928, xxvii., 46. Dick, G. F., and Dick, G. D.: Jour. Amer. Med. Assoc., 1925, lxxxiv., 803. Parish, J. H., and Okell, C. C.: THE LANCET, 1927, i., 71, and Jour. Path. and Bacteriol., 1927, xxx., 521.

ÆTIOLOGY OF HYPERPIESIS IN EGYPTIANS.*

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THE conclusions in this paper are based on a study of over 3000 cases, many of whom were traced for 10 to 15 years. All were seen in private practice, so that they were observed over a much longer period than is possible in a hospital; observations for short periods on a disease which seems to be lifelong are misleading, and give a false idea of its natural course.

Chronic primary hyperpiesis in the absence of chronic inflammatory renal changes is quite common in Egypt, and forms at least 10 per cent. of all cases in private clinics, but is rare in hospital practice. For four years, 1913–1917, not a single case was admitted, and in the following years only two genuine cases could be picked out. The disease is especially limited to the two decades 35–55, and is very rare under 30; the youngest patient was a student of 27 whose father and mother had both suffered from the disease, which appeared in him when he was 23. The condition is rare after 60, and the eldest patient was about 75. About 10 per cent. of the cases are females.

Out of 100 consecutive cases 37 were fellahin of the middle class, 17 were lawyers, judges, and mental workers, 10 were doctors, and 10 females; the rest came from clerical and other occupations, two being railway porters.

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* Summary of several addresses given to Kasr-el-Aini Hospital Society and Egyptian Medical Society.

Diet, Nervous Influences, Toxins, and Infections.

That excess of food, especially protein, causes a hyperpiesia is undoubted. The rise is, however, temporary, and the pressure falls gradually and sometimes suddenly as soon as the intake is limited.

A young man of 30, weighing 72 kilos, developed pulmonary tuberculosis and was advised to over-feed. His blood pressure rose from an average of 100/75 to 200/100, and remained up for about six months, during which time his weight increased by 25 kilos. With limitation of diet and graduated exercise the pressure fell to 150/105 in the course of three months, and has remained there till now (three years).

Excess of diet plays a part in acute hyperpiesis in normal subjects or in extra rises (often temporary) in subjects of chronic hyperpiesia. That diet is certainly not the cause of the latter is shown by the fact that 40 per cent. of cases of high hyperpiesia were of normal weight or slightly under. Overfeeding and overweight is by no means always accompanied by rises of pressure, and in women of a certain class, especially at the climacteric, though overweight is common, less than one-fifth have hyperpiesia.

That strong emotional disturbance can cause marked rises of pressure is certain; the effect is, however, temporary, and in no single case was a permanent effect found.

A lady of about 50, previously in good health, with systolic pressure ranging from 120–140 for years, suddenly, after prolonged grief, complained of severe headache, congestion of the face, and asthmatic-like attacks at night. Blood pressure 310/160. No sign of local nerve lesion. Urea 30 mg. or 0·03 per cent. of blood; urine normal. Venesection and elimination treatment with bromides lowered the pressure to 200/100–240/110 in about six days, but the systolic pressure remained about 200 for at least two months in spite of treatment. On separation from her husband (apparently a great mental relief) the pressure fell to 120–150, and for the last year and a half there has been no return to the high figure.

Many similar cases were observed, and in all of them the pressure fell as soon as the nervous condition improved. Nerve storms are important causes of rise of pressure in normal subjects, of extra rises in hyperpietic cases, or even of onset. That they are not the sole cause is shown by the fact that fully one-third of the cases occurred in placid men and women of the middle class with sedentary habits, many of them unable to read or write and having no special complaint. Conversely, hyperpiesia does not necessarily follow emotional states.

That certain substances absorbed from the alimentary tract have a pressor action has been shown experimentally, and some—e.g., isoamylamine, P-hydroxy, phenylethylamine, and phenylethylamine—have been isolated. These and similar substances may be operative in acute cases of hyperpiesia, as shown by the rapid fall of blood pressure (often permanent) on elimination treatment and starvation. In chronic primary hyperpiesia the blood pressure is affected very little if at all by any method of treatment. Formerly, hyperpiesis was looked upon as an untoward sign in all cases, and every effort was made to lower it, including rest in bed for months at a time, repeated venesection, repeated doses of calomel and salines, and strict lacto-vegetarian diet with two starvation days per week. It soon became clear that the resulting fall was slight, and in some cases the pressure actually rose during the treatment—showing conclusively that the rise was not due to absorbed toxins, the amount of which should have been diminished by a very restricted régime.

A railway inspector was seen on several occasions in 1919 with average blood pressure 170/80 and nervous symptoms (fatigue and insomnia) suggesting neurasthenia. With absolute rest in bed and milk diet the symptoms markedly improved, but the blood pressure rose to 220/100. The patient remained in perfect health, and for the next three years his pressure ranged from 200–220. Since then nothing has been heard of him.

The course taken by chronic hyperpietics is a continuous one with few intermissions (extra rise or fall), which would certainly not be the case were the rise due to absorption of toxins, the amount of which would be subject to continuous variations. Again, toxins, whatever their nature, would give rise to other symptoms besides hyperpiesis, but these patients continue generally for years without any symptoms at all; some have been traced for 15 years and some, with a reliable medical history, for 25 years. Occasional symptoms, such as headache, giddiness, dyspnœa, or asthmatic attacks, can be easily shown to have no relation to the chronic malady. They bear no relation to the degree of hyperpiesis, and often occur without extra rise of the blood pressure, and in some with a relative fall. They can be relieved by eliminative treatment, which does not affect the height of the blood pressure, for this is in many cases higher after treatment than before. These symptoms are due to absorption of substances with a pressor or a depressor effect, and have no relation to the original disease.

An example is afforded by a patient with severe headache following trephining for chronic glaucoma, unexplained by the eye condition. The blood pressure varied from 220/110 to 230/130, and remained approximately at the same height for six weeks; with blood-letting, elimination, and starvation it dropped at times to 200, but the headache did not disappear. Finally the headache disappeared spontaneously, but the pressure has remained at about 240/140, with occasional rises, until now (2½ years).

Graver and more permanent symptoms which occur in hyperpietics are due to arterio-sclerosis or its complications, and not directly to the hyperpiesis. Much, however, may be said in support of the view that arterial disease is secondary to the increased pressure.

Syphilis, at times suspected as a cause, certainly has no relation to the disease; repeated courses of bismuth, mercury, and arsenic will change a positive Wassermann to negative without changing the pressure. Temporary rises of pressure occur in syphilitic subjects, as in normal subjects, but that has no relation to the chronic malady.

A history of old infectious fever (typhoid, malaria) is quite common, but so high is the incidence of both the infectious fevers and hyperpiesia that no causal relation between them can be established. A notable feature is the absence of ankylostoma and pellagra, and, to a lesser extent, of bilharzial infection, diseases which are very common in hospital class patients, in whom hyperpiesia is almost non-existent.

Alcohol as a cause can easily be dismissed, as the majority of patients had never tasted it. Tobacco seems to lower the tension, and some of the marked hypotensives were heavy smokers (over 40 cigarettes daily). Excess of coffee seems to be responsible for temporary rises of pressure in normal individuals and hyperpietics. No causal relationship can, however, be drawn between the amount of coffee taken and the degree of hyperpiesis. Some of the marked hypotensives were patients who consumed 40 cups daily (4·0 g. caffeine) for years, and fully one-third of all cases of hyperpiesia drank no coffee, or less than 10 cups daily (1·0 g. caffeine).

The Family History.

The disease is hereditary and social, and in many cases familial. In 100 consecutive cases 72 had a history in the father or mother, brothers or sisters, uncles or aunts, suggesting death from one of the complications of the disease—e.g., a hemiplegia or death suddenly after a meal (angina pectoris) or an attack of dyspnœa or fatal epistaxis. This generally occurs in the fifth and sixth decade, and is well known amongst the middle class, who are the chief sufferers, and often a man will come for examination for no other complaint than that his father or mother died from or was affected with hemiplegia.

In some cases notable family histories occur—e.g., a merchant in Upper Egypt (Mallawy), aged 55, seen a year ago. His blood pressure ranged from 180/100 to 200/120. His father died about the age of 60 with coma and hemiplegia; his mother died, when over 60, with hemiplegia. Three brothers, aged respectively 50, 48 and 44, all showed pressures between 160 and 200 on several occasions.

Another marked example was that of a merchant affected with the disease, whose father, mother, two sisters, and four brothers were all affected (except one brother who had rheumatic endocarditis).

As a control the family history of 100 consecutive cases of other ailments was taken, and only 25 per cent. gave a history of father or mother being affected with symptoms suggesting hyperpiesia.

The Relationship between Hyperpiesis and Diabetes.

In families where only one member is affected with hyperpiesis, a clear history of diabetes is often given, and sometimes some members of a family are affected with diabetes, some with hyperpiesia, and some with both. The relation between diabetes and hyperpiesis is very close. Both are diseases of the middle and upper classes, and very rare in the poor-class hospital patient. Both run a very long course, and for years there may be no symptoms in the absence of complications. The chief age of onset in both diseases is from 30–40, and the duration of both is approximately the same. The majority of hyperpietics die in the 'fifties and 'sixties; diabetics, having better treatment, generally die in the 'sixties or 'seventies. The age of onset and duration account for the rarity of hyperpiesia above 65 and of diabetes above 75. Amongst several thousands of hyperpietics seen in 15 years I can only recall nine cases above 65, including two between 70 and 80. The same statement holds good for diabetics, if allowance is made for slightly increased longevity. Both diseases run their course in spite of any treatment. This is certainly true of hyperpiesia, and was true of diabetes before the days of insulin and regulated diet. Except in acute crises treatment of hyperpiesia is useless, and at times dangerous; the rise of pressure is certainly compensatory. Attempts to lower the pressure by venesection, elimination, vaso-dilators, diet, &c., were in the majority of cases unsuccessful, and in those in whom it was lowered temporarily symptoms arose (cerebral, renal or cardiac), apparently due to the anæmia which only disappeared on resumption of previous habits. The patient has to choose between a slightly prolonged and restricted life and a useful, apparently normal, short one, often terminated suddenly by fatal cerebral hæmorrhage, angina or uræmic-like symptoms. I certainly do not agree with Clifford Allbutt when he says: "If we catch hyperpiesis early and keep at work against it, it can be cured more often than not."[1] Hyperpietics who do not die from complications end with uræmic-like symptoms of auto-intoxication, analogous to diabetic coma. The similarity is so great that I surmise that hyperpiesis is due to a metabolic disturbance (dyscrasia), often inborn and hereditary. Nothing is known about the relation of this disorder to ductless glands. A full trial of thyroid and parathyroid was made for months, and sometimes for years, in suspected cases, and the results, though encouraging in a small number, can only relate less than 2 per cent. of all cases to deficiency of internal secretions. One thing seems certain, and that is the relation of the hyperpiesis to the metabolic change; the rise of pressure is entirely compensatory, and as long as the pressure is relatively sufficient no symptoms arise, and the individual enjoys normal habits. Only when the pressure begins to fall do symptoms appear referable to the metabolic dyscrasia.

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[1] Clifford Allbutt, Diseases of the Arteries, vol. ii.

WESTERN OPHTHALMIC HOSPITAL, MARYLEBONE, AS A "DANGEROUS STRUCTURE."—This hospital has been served with a "dangerous structure" notice by the district surveyor of Marylebone on the ground that the building "might collapse at any moment like a house of cards," and its demolition has been begun. Great difficulty has been experienced in finding accommodation for the patients, 18 of whom are awaiting operation. The hospital is an old Georgian building in the Marylebone-road, very cramped and inconvenient, with wards the size of small bedrooms. The operating theatre is only a few feet square with a floor of rough boards, and a roof which leaks in wet weather; there are no facilities for moving patients after operations. A rebuilding scheme to cost £10,000 was prepared some time ago, and £23,000 has so far been collected.

Clinical and Laboratory Notes.

A NOTE ON
BLOOD CHANGES ASSOCIATED WITH LIVER DIET IN YOUNG CONVALESCENTS.

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IN order to find out whether the blood changes obtained with liver diet in cases of pernicious anæmia were confined only to that disease, it has been thought worth while to study the blood changes produced by the same diet in hospital patients free from any blood disease. Whereas the original work of Whipple indicated that liver diet was likely to be useful in all forms of anæmia, the first recorded results with liver diet in pernicious anæmia suggested that it was most specific for pernicious anæmia and exerted its maximum effect only in that disease. Recently it has been found by Vaughan[1] and others that some cases of secondary anæmia respond to liver treatment, and we have found that relatively normal children show a transient but definite stimulatory response to liver feeding.

The 11 cases selected for treatment in this investigation were between the ages of 3 and 15 years with the single exception of one girl aged 19. The majority of the patients were in surgical wards and were, during the experimental period, convalescing from such surgical conditions as inguinal hernia, tuberculous adenitis, and submaxillary abscess; others were in medical wards under treatment for such diseases as mediastinal adenitis and oxaluria. On account of the special interest attaching to the blood changes observed in them two cases are included in which the lymphatic system seemed principally affected; these were cases diagnosed as Hodgkin's disease and glandular fever.

Fresh cooked liver was given daily, the amount varying with the age of the patient; the older patients received 3 oz. daily and the younger ones 2 oz. A blood examination was made in every case before starting the diet and the feeding was continued for periods varying between six and 40 days. In the first few cases examinations were made at intervals of three or four days for a period of three weeks, but experience showed that the maximum effect was noticeable after about six days and that it declined thereafter. In no case was hæmatinic drugs given during the time of liver feeding.

The table shows the results with the 11 patients. In most cases the changes in red and white cell counts and in the hæmoglobin percentage have been included, whilst the alteration in the differential leucocyte count are recorded in all. The last two columns show the variations in the granular and non-granular cells in order to contrast the changes in bone-marrow cells with those taking origin from some source other than the bone-marrow. Such observations as were made on the red cells and hæmoglobin show that these tended to increase. A leucocytosis was produced in seven out of the 11 cases. In seven cases also there was an increase in the relative and absolute number of polymorphonuclears. Neither the increase in the total leucocytes nor the increase in polymorphonuclears was maintained for longer than ten days. Lymphocytes showed a relative but not absolute reduction in nearly all cases. A definite absolute increase in eosinophils was produced in all instances, the striking figure of 61 per cent. being found in the case of Hodgkin's disease. An increase in granular or bone-marrow cells was also the rule.

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[1] Vaughan, Janet: THE LANCET, 1928, i., 1063.

These results show that the administration of liver to patients who suffer neither from pernicious anæmia nor any other blood disease produces alterations in the blood comparable to those occurring in the treatment of pernicious anæmia. An interesting feature of the series is the eosinophilia which has been also found in pernicious anæmia by one of us (L. E. H. W.),[2] and in secondary anæmia by Vaughan.[1] The definite increase in the red cells and bone-marrow leucocytes shows that liver must exert a stimulating action on the bone-marrow. It is difficult to believe that stimulation is the only action in pernicious anæmia though evidently it is one essential feature.

We are inclined to suggest that liver is rich in a substance essential for the proper functioning of the bone-marrow; in pernicious anæmia, this substance, whatever it may be, is not absorbed in sufficient quantity from an ordinary mixed diet, perhaps on account of the achlorhydria, though it is possible to assimilate enough with massive liver feeding.

Case.	Age.	Disease.	Dose in oz.	Days after feeding started.	Blood changes: Red cells in millions; leucocytes in thousands (absolute figures).							
					Red cells.	Hb.	Leucocytes.	Polymorphs.	Lymphocytes.	Eosinophils.	Cells. Granular.	Cells. Non-granular.
1	3	Submaxillary abscess.	2	6	4·85→5·75	66→66	7·6→20·0	2·4 → 8·6	4·4 → 9·0	0·095→ 0·8	2·6 → 9·4	5·07→10·6
				9	4·8	66	16·4	6·5	7·85	1·2	7·6	8·8
2	7½	Cervical adenitis (T.B.).	2	6	5·3 →6·1	80→82	8·2→21·5	3·6 →12·0	3·9 → 7·5	0·05 → 0·7	4·1 →12·8	4·1 → 8·7
				9	6·3	84	10·6	5·95	3·5	0·6	6·5	4·1
				10	6·8	86	4·9	2·1	2·5	0·1	2·3	2·6
3	3½	Submental abscess.	2	6	5·3 →6·2	72→78	4·3→28·6	2·4 →16·9	1·5 → 9·4	0·1 →10·0	2·55→17·9	1·75→10·7
				13	4·95		23·0	10·9	10·4	8·0	11·7	11·3
4	6	Hernia.	2	6	—	—	6·5→10·2	3·9 → 6·45	2·45→ 3·06	0 → 2·5	3·9 → 6·5	2·6 → 3·7
5	7	Mediastinal glands.	2	6	—	—	19·2→11·4	9·6 → 5·4	8·8 → 3·9	0·02 → 0·47	10·2 → 5·9	9·0 → 4·5
6	5	Tuberculous lymphadenitis.	2	7	—	—	11·8→11·4	8·1 → 7·5	3·1 → 2·9	0·2 → 0·6	8·4 → 8·2	3·4 → 3·2
7	9½	Oxaluria.	3	8	5·04→5·8	—	7·4→ 5·6	3·3 → 3·2	3·3 → 1·5	0·5 → 0·6	4·0 → 3·8	3·4 → 1·8
8	19	Fragilitas ossium.	3	10	—	—	7·8→13·0	4·4 → 7·0	2·6 → 4·4	0·05 → 0·9	4·8 → 7·9	3·0 → 5·1
9	14	Mitral stenosis.	3	15	—	—	16·2→16·8	7·8 → 9·6	7·6 → 5·5	0·4 → 0·5	8·1 →10·0	8·1 → 6·8
10	15	Glandular fever.	3	8	4·7 →5·59	75→78	9·8→12·8	4·85→ 6·7	4·2 → 5·1	0·2 → 0·6	5·2 → 7·2	4·6 → 5·6
11	9	Hodgkin's disease.	3	18	3·1 →3·9	65→66	18·6→21·4	15·4 → 3·6	2·6 → 3·5	0·06 →13·0	15·6 →16·6	3·0 → 4·8
				21	4·09	74	16·8	3·4	4·7	8·0	11·6	5·2
				40	3·9	66	14·0	2·8	3·1	3·4	10·4	3·6

We are indebted to Dr. C. E. Lakin, Dr. E. A. Cockayne, and Mr. E. L. Pearce Gould for the clinical material.

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[2] THE LANCET, 1928, i., 285.

A COMPARISON OF THE "TITANIUM RAY" WITH THE METALLIC TUNGSTEN ARC.

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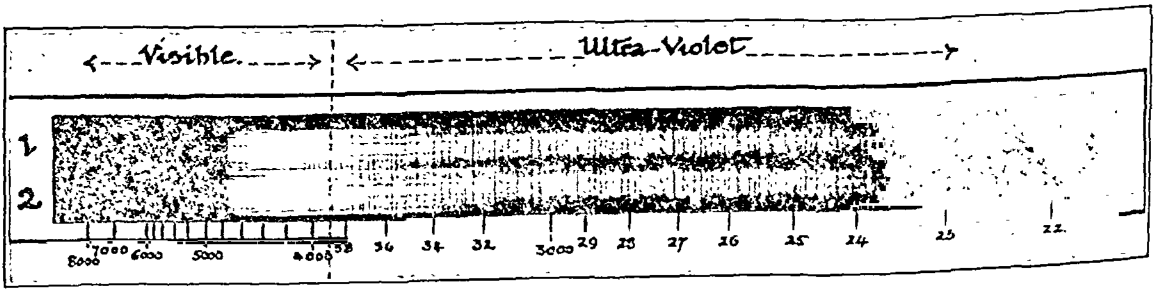
(*From the Physics Department, Middlesex Hospital.*)

CONSIDERABLE interest has been aroused recently by a new arc designed for therapeutic work which is termed the "titanium ray." The arc is formed between metallic electrodes which consist of a tungsten alloy containing, it is claimed, approximately 4 per cent. titanium.

Titanium is a rare metal which occurs in small quantities in a large number of ores, and hence is often present in different metals as an impurity. The characteristic arc spectrum of the metal has a number of intense lines in the ultra-violet region. Samples of the electrodes supplied for generating this arc were obtained and the arc spectrum tested by means of a Hilger quartz spectrometer. For purposes of comparison, the spectrum given by metallic tungsten of the quality used in therapeutic work was included on the same plate. The photograph of the two spectra is shown in the illustration, and it will be seen that they are practically identical both in the range of the ultra-violet and the distribution of the intensity. Detailed examination of the plate under a low-power microscope shows certain minor lines as more intense in the "titanium ray" spectrum than in that given by commercial tungsten. These variations are, however, so slight that the difference in the quality of the radiation from a therapeutic point of view must be considered as negligible.

The print reproduced here was obtained from a single plate containing the spectra of the two sources. An incandescent filament lamp was used for printing and the distance of the lamp from the plate was adjusted so as to bring out the full range of the radiations.



The upper spectrum (1) is that of the "titanium ray" and the lower (2) is that of the tungsten arc. Exposure in each case 30 seconds. (Photographed on an Ilford Process Plate.)

A further test was made of the intensity of the radiation from the two arcs judged by the production of erythema on the skin. Two small areas of skin close together on the forearm were exposed consecutively to the arcs running under identical conditions as far as could be done. (Current, 6 ampères; P.D. across electrodes, 58 volts; voltage of supply drawn from a bank of large accumulators, 120 volts.) Three distinct pairs of exposures were made on different days and in each case the erythema produced by the "titanium ray" and the tungsten arc could not be distinguished in depth of coloration and the latent period between the exposure and the appearance of the reaction was the same.

It has been stated that the "titanium ray" is more penetrating than other sources of ultra-violet light, but, judging from the evidence of the experiments described above, the penetration of the radiation can be no different from that of other sources with a similar spectral distribution.

A CASE OF

ABSCESS OF THE HEART CAUSING DEATH THROUGH CORONARY HÆMORRHAGE.

By Francis McLagan, M.B. St. And., D.P.M.,
ASSISTANT MEDICAL OFFICER, CANE HILL MENTAL HOSPITAL, SURREY.

A case of abscess of the heart apparently resulting from staphylococcal infection of the skin, and without evidence of general pyæmia, is so rare that its description seems to be justified. Not only is the occurrence uncommon, but in the case reported death was due to rupture of the abscess into one of the coronary arteries and the pericardial sac, giving rise to a condition which simulated, and was at first mistaken for cardiac rupture.

The Case Described.

A married man, aged 57, was admitted to hospital under certificate on Jan. 30th. Previous to certification he had been in poor health for some time and his latest occupation had been the somewhat arduous one of labourer. During his multifarious pursuits—principally as soldier and stoker—he had contracted malaria in Upper Burma and suffered from sunstroke in India many years previously. His condition on admission, however, was not thought to be consequent on these misfortunes. His personal history, as related by his wife, showed him to be a man of temperate habits who, four years previous to admission, became weak, was subject to numerous boils and carbuncles, and developed tremors of the legs.

On admission he exhibited many old scars, the result of boils and carbuncles in the region of the back and legs, but only one scar on the upper part of the body, and that on the right shoulder. His chest was fairly well covered, but the excursions on respiration were limited. No abnormality of the lungs was apparent on percussion, but on auscultation râles and rhonchi were heard to such an extent that the heart sounds were obscured. The apex-beat was 2 in. outside the nipple line, and the left border of the heart was found in a corresponding position. His arterial system, as judged from palpation of the radial artery, exhibited marked atheromatous and senile changes. He was very unsteady on his legs and walked with a very wide gait, and on examination of his reflexes it was found that his knee-jerks were very brisk and exaggerated.

As the mental disturbance has no bearing on the point under consideration, a detailed account of his psychosis can be omitted. It is considered only sufficient to state that although his memory was greatly impaired, he suffered from no delusions or hallucinations, and he was capable of appreciating pain or distress and communicating his sensations to those in attendance.

On Feb. 18th he developed a large carbuncle over the right trochanter, was put to bed, and received appropriate treatment in the form of free drainage. The carbuncle responded well to treatment, but three days later (Feb. 21st) a boil appeared on the left hip. This, however, had healed by March 7th, but the original area, although clean, had not closed. On March 12th another carbuncle appeared on the right buttock and several others appeared in a few days in the region of the hips, buttocks, and sacrum. On the evening of March 30th the patient conversed as usual with the medical officer and complained of no unusual symptoms, but at 12.5 A.M. on the following day it was reported that he seemed to have had a "seizure" and had collapsed. When seen by the medical officer he was found to be in extremis, and despite treatment he died at 12.20 A.M.

The Wassermann reaction of the blood and cerebrospinal fluid was negative.

Post-mortem Findings.

At autopsy marked atheroma was apparent in all areas of the body with consequent cerebral softening; enlargement of the cerebral ventricles and increased submeningeal fluid. The heart was enlarged, weighing 530 g., and showed marked myocardial hypertrophy with fatty degeneration; these latter pathological changes were most apparent in the left ventricle. The cardiac valves appeared normal, apart from slight atheromatous changes, and gave no evidence of vegetations or acute inflammation. The pericardial sac was filled, but not distended, with a soft blood-clot and a small tumour in the region of the great vessels. The tumour formed a small protuberance ½ in. in diameter and projected about ¼ in. from the surrounding heart wall. It was found on examination to be softer in consistency than the normal muscle, and one small channel was discovered through which a probe could be passed into the right coronary artery ½ in. from its origin in the sinus of Valsalva. On making a cross-section of the growth a loculus was encountered containing about 1 c.cm. of pus; unfortunately, no culture media was at hand and the nature of the causative organism remains in doubt.

All the other organs of the body were carefully examined and no evidence of pyogenic infection was discovered other than the cutaneous lesions already described, and pyorrhœa alveolaris. The viscera, apart from the lungs which were passively congested, showed degenerative changes subsequent to the impaired blood-supply brought about by the atheroma.

It is presumed that the condition was one of multilocular abscess (carbuncle) of the heart wall in which the pus had tracked, in one of the loculi, in two directions—to the coronary artery and to the pericardial surface of the heart. In this manner a channel had been formed through which the blood had flowed into the pericardial sac, producing a mechanical resistance to an already greatly weakened heart and so caused death.

I wish to express my thanks to Colonel S. C. Elgee, medical superintendent of Cane Hill Mental Hospital, for permission to publish this case.

Public Health Services.

THE HEALTH OF LONDON IN 1927.

Dr. F. N. Kay Menzies, in his report on the County of London for the year 1927, explains that in recent reports the general public health services have been extensively dealt with, and that in the present instance he has devoted more attention to the school medical service, which, "joining hands with social agencies, is more intimately in touch with the domestic lives of the people, and in this way exercises a material influence on the general public health."

General Health Services.

Statistics.

The Registrar-General's estimate of the population was 4,550,000, including 9000 non-civilians. The 73,263 births gave a birth-rate of 16·1 per thousand. In 1901, when the population was about the same, the births were 57,829 more. The death-rate was 12·1, as compared with 11·6 in the previous year, and the increase was almost entirely due to the influenza epidemic at the beginning of the year, which caused an increased mortality at the higher ages. Fatal street accidents caused 669 deaths as compared with 656 in the previous year, but the deaths of children under 15 were 14 less. The weather favoured infant life, and a decreased mortality from diarrhœa produced an infant mortality-rate of 59, the lowest ever recorded in London. The death-rate from phthisis was 0·91; from all forms of tuberculosis, 1·05; from cancer, 1·49; from pneumonia, 1·0; from bronchitis, 0·83; from pneumonia, bronchitis, and influenza combined, 2·23; and from diarrhœa and enteritis under two years, 7·6 per thousand births, to be compared with 12·0 in 1926.

The table for the metropolitan boroughs, excluding the City, shows that the lowest infant mortality-rates were recorded in Holborn (38), in Woolwich (42), and in

Lewisham (46); while the highest were in Paddington (79), Chelsea (76), and Shoreditch (74). From phthisis, the lowest rates were in Hampstead (0·44), in Kensington (0·65), and in Paddington (0·67); the highest were in Finsbury (1.36), in Bermondsey (1·22), and in Holborn (1·21). The lowest rates from pneumonia were recorded in Woolwich (0·67), Wandsworth (0·67), Hampstead (0·70), Greenwich (0·73), and Battersea (0·73); while the lowest rates from bronchitis were in Chelsea (0·50), Hampstead (0·59), Stoke Newington 0·59), and Hackney (0·60). The lowest rates from cancer were in Holborn (1·18), Shoreditch (1·27), and Bethnal Green (1·29); while the highest were in Chelsea (2·21), Hampstead (1·86), and Kensington (1·84). The puerperal fever incidence per thousand births was 3·57 for London and varied much among the boroughs, being lowest in Deptford (0·53), Kensington (1·13), and Stoke Newington (1·37); and highest in Chelsea (8·2), Fulham (6·98), and St. Pancras (6·68).

Dr. Menzies points out that the mortality from puerperal fever is much lower in boroughs with poorer-class populations, than in those populated largely by the well-to-do. Thus in the years 1921–25 the rate in the aggregate population of Bermondsey, Bethnal Green, Finsbury, Stepney, and Shoreditch was 0·88 per 1000 births, as compared with 1·80 in the aggregate population of Hampstead, Kensington, Lewisham, Stoke Newington, and Wandsworth. In 1927 the mortality from puerperal fever in London was 3·22 per thousand births among single women, as compared with 1·15 among married women, while the rates from other accidents of childbirth were 2·93 and 1·46 respectively. The suggestion is made that the statistics of maternal mortality from childbirth should be given for legitimate and illegitimate births separately.

Small-pox.

There were 5 cases of small-pox in the county. One case was of the mild type and imported from the north of England. The other 4 cases were apparently connected with an outbreak in Hendon which took place in March to May from some unrecognised source. This outbreak included 13 cases, of which 7 were fatal, including 2 of the 4 London cases. The first case of this outbreak was a man of 47, vaccinated only in infancy and his illness was considered to be chicken-pox. As the result of this failure in diagnosis, clothes were sent to the laundry and further cases occurred among the laundry workers, 4 of which proved fatal.

Anthrax.

During the first week of January 4 cases of anthrax occurred in connexion with the Zoological Gardens. All of the patients had been engaged in handling the carcasses of two elephants which had died from an illness the nature of which was not recognised until after the men were infected. Anti-anthrax serum was promptly administered and all the patients had fairly mild attacks. A prophylactic dose of serum was also given to 29 persons who had been in contact with the carcasses and no further cases occurred.

Encephalitis Lethargica.

There were 149 notifications of encephalitis lethargica, of which 114 were considered to be true cases. Of these, 49 had proved fatal up to March 31st, 1928.

A table indicates the present condition as regards 528 cases of encephalitis which came under observation from 1925 to 1927. Of these, 132 under the age of 16 and 111 over the age of 16 are stated to have recovered. Since November, 1925, the M.A.B. have provided 100 beds for children between the ages of 3 and 16 suffering from the after-effects of encephalitis. At Winchmore Hill Hospital Dr. G. A. Borthwick, the medical superintendent, has recently reported that this experimental unit has not been productive of curative results, but has proved valuable for observation purposes. It has also housed children whose mental condition unsuited them for outside life. In most cases he considers that the nerve-cells have been irretrievably damaged, but in a minority it may be possible by patient endeavour to educate other cells to function in the place of those destroyed. While he cannot recommend the Board to continue the section as an experimental unit with curative hopes, the need for housing these difficult and pitiful cases may be sufficient justification for carrying it on.

Cancer.

An analysis is given of the deaths from cancer in London during the period 1911 to 1920. The deaths are divided into three groups. In group 1, comprising growths of the upper alimentary tract, the death-rate per million among males was 336 as compared with 46 among females. In group 2, comprising growths of the reproductive system, the female death-rate was 509 and the male rate 52. In group 3, which includes all other cancers, the sex-incidence was approximately equal. The excessive female mortality in group 2 is shown to occur at an earlier age than the excessive male mortality in group 1. Some of the conclusions drawn from this analysis are: (1) that among persons over 35 the movements of the cancer mortality from 1850 onwards are correlated with the year of birth and not with progressive changes in conditions of life; (2) that if this same correlation holds in the future, the female mortality-rate will continue to decline while the male rate will increase further for some time; and (3) that a cancer diathesis may be the dominating factor and that the solution of the cancer problem may ultimately be found to depend upon the detection and modification of such diathesis.

Tuberculosis.

During 1927 2305 samples of milk from 32 counties were taken at London railway termini. The bacteriological examination was completed for 1969, of which 154, or 7·8 per cent., yielded tubercle bacilli, as against 4·5 per cent. in 1926. Information was sent to the county medical officers of health and as a result 59 cows were slaughtered under the Tuberculosis Order. In the case of 311 of the samples, the inoculated guinea-pigs died from an acute infection, and notice of this was also sent to the medical officers of health on the chance of its being due to unsatisfactory conditions in the cowsheds. The conditions of patients who received residential treatment under the council's tuberculosis scheme are investigated after the lapse of five years. Adult cases treated in 1921, numbering 3178, were investigated. Of 468 pulmonary cases without tubercle bacilli, 83·5 per cent. were alive; of 330 early cases with tubercle bacilli, 61·5 per cent. were alive; of 1299 moderately advanced, 34 per cent. were alive; of 858 advanced cases, 3·7 per cent. were alive; and of 223 "surgical" cases, 73·5 per cent. were alive. The particulars as to children under 16 were as follows: Of 271 pulmonary cases without tubercle bacilli, 90 per cent. were alive; of early cases with tubercle bacilli, 44·5 per cent. were alive; of 18 moderately advanced, 50 per cent.; and of 33 advanced 3 per cent. were alive. Of the 189 children treated for non-pulmonary tuberculosis, 153 were alive, of whom 71 were at school and 58 at work.

In 1926 arrangements were made to try artificial light treatment in connexion with the dispensaries. The number of cases treated has been small but the results have not been encouraging, and it is suggested that the best results will only be obtained in residential institutions. The scheme, however, is to be continued for another year. With the help of the Invalid Children Aid Association, 146 children living in contact with advanced consumptives were boarded out in the country. The arrangements for residential treatment for children have been improved and there is now no waiting-list either for pulmonary or surgical cases.

Venereal Diseases.

The new cases of syphilis were 357 and the new cases of gonorrhœa 813 in excess of the figures for 1926. Although a number of patients still fail to complete the full course of treatment, the ratio of attendances has gone up to 40 per new case. The number of non-venereal cases who present themselves for examination at the clinics has shown a steady increase. Thus in 1917 the non-venereal cases numbered about one-sixth of the venereal. In 1922 they numbered about one-third, and in 1927 they numbered more than one-half. The practitioners qualified for free supplies of salvarsan, &c., now number 446, as compared with 108 at the end of 1917.

SCHOOL MEDICAL SERVICE.

The school report indicates a steady progress of the improvement programmes dealing with the reduced size of classes, improved desks, and sanitary conditions. There is even a revolt against desks altogether. Infant departments are already equipped with table and chairs instead of desks.

Rheumatic Children.

Dr. J. Nairn Dobbie has continued his investigations with regard to rheumatic children. His material was 100 cases admitted under the council's scheme to Carshalton or Highwood hospitals. Of these children, 79 were below the average in nutrition; while 19 showed no evidence of heart affection, 42 were "suspicious," and 39 definitely affected. The tonsils were seldom markedly enlarged; adenoids were not a noteworthy feature, and the children did not belong to the "catarrhal," but rather to the nervous type. Their educational attainments were below the average. In 44 cases the parents stated that the children had been "nervous" all their lives, and Dr. Dobbie favours the view that this nervousness is inherited. In 66 there was history of rheumatic incidence on the "immediate" family, and in only 23 was there no rheumatic family history. The homes of 35 were slums and of 53 more semi-slums. Dr. Dobbie's impression was that the actual dampness in most of the houses was of small degree. In the case of such homes the washing of clothes is done at the public baths. To sum up the environment: "It would appear that no one disadvantageous factor stands out, but rather that each and all of the concomitants of poverty, poor houses, dampness, unhealthy sites, overcrowding, lack of ventilation and of sunlight, poor feeding, poor clothing, irregular habits, &c., destructively converge on these unfortunate children, who wilt along the lines their bias carries them, be it marasmus, rheumatism, tuberculosis, or the respiratory diseases generally."

Nursery Schools.

A special report deals with nursery schools in London, Manchester, and Bradford. At the outset it is pointed out that the medical objections to a large school—e.g., the McMillan with an average attendance of 220—have been overcome. These schools are needed *most* for the *most* neglected children from the worst homes. There should always be some bathing accommodation and *an open air régime*. The social function of the school is twofold; it trains the children and by *educating* the mothers, raises the home life to a higher level. "The potential under dog, rebel, or anarchist can be recognised among the entrants to the nursery school, but it is seldom they are not transformed into orderly, active, and happy citizens of their community." Educationally, no attempt is made to teach the three R's, and the most profitable pursuits are rhythmic movements, speech training, and hand work. Special training is needed for the staff and there is at present a dearth of such training centres. To be drawn to the work is not enough. "The nursery school teacher must not only be a lover of children, but a knower of children as well, and a knower of all the factors that make for health, growth, and happiness." The nursery school must develop its own methods and create its own traditions, and must not be absorbed into elementary education until it is strong enough to reform the infant school from the bottom. The education of the younger pupils has hitherto suffered too much from academic and bookish traditions proceeding from the top.

Dr. Menzies takes exception to the statement of the chief medical officer of the Board of Education that London is an area without an orthopædic scheme. He shows that the council has not neglected its duty to the crippled children of London despite the disadvantage that it is not the local authority under the Maternity and Child Welfare Act. He also gives reasons to show that the percentage of children who leave the physically defective schools of a district wearing apparatus is not a satisfactory index of the efficiency of the district's orthopædic scheme.

Mr. Sowden Hills, inspecting dental surgeon, has completed a comparison of English and Jewish children as regards dental condition. About 7000 children were examined. He finds that up to the twelfth year there is no marked divergence, but that after this age the English boys show an increase in the amount of dental decay while the Jewish boys show a decrease.

MENTAL HOSPITAL REPORTS.

THE *City of Leicester Mental Hospital* at West Humberstone had 941 patients on its books on March 31st, 1928. The ratio of mentally afflicted in Leicester is now 1 : 304; ten years ago it was 1 : 338. The recovery-rate for 1927 was 45·66 per cent. and the death-rate 6·31 per cent., figures which compare very favourably with the average for all public mental hospitals. Autopsies were held on 90 per cent. of those who died. Leave of absence was granted on 2870 occasions, and 52 per cent. of men and 37 per cent. of women patients have full or limited parole. Only 13 temporary and 3 permanent escapes resulted from this liberty. Small parties go out regularly for motor drives and to the cinema, and 78 per cent. of the patients are usefully employed. A cinematograph was installed in the recreation hall in the autumn. The old house of the medical superintendent has been converted into a female block; 32 new beds will be provided at the very low cost of £64 per bed. A new nurses' home is to be built. Two more members of the staff have obtained their M.P.A. certificate. A "Trinity" ultra-violet ray outfit has been installed in the X ray department. The pathologist reports on the malarial treatment of 12 more cases of general paralysis. Only one non-paralytic patient showed any improvement after induced malaria, but of 48 paralytics 25 per cent. have been discharged recovered and another 14·5 per cent. are "much improved." Reduction of the globulin and cell content of the cerebro-spinal fluid has been noticed, and in several cases the colloidal gold curve has changed to the luetic type. The investigation into the incidence of syphilis shows that of 218 males 7·5 per cent. and of 286 females 4·9 per cent. gave positive Wassermann reactions. The dental surgeon reports 347 operations, 99 inspections, and 27 refusals of treatment. All new admissions are inspected by him. The oral condition in general shows steady improvement.

The *City of Worcester Mental Hospital* at Powick housed 1056 patients at the end of last year. The discharge-rate was 43·52 per cent. and the death-rate 7·12 per cent. Post-mortem examinations were made in 65·75 per cent. of instances. The general health was good save for influenza and one case of erysipelas. Three babies were born in the hospital; two of the mothers have since been discharged. The new verandah for male patients fills a long-felt need, but the hospital still lacks clinical rooms, an admission block, and a convalescent villa. A continuous bath has been installed in one of the female wards. Thirty-three patients went out on trial, and 38 had parole within the estate. Six nurses obtained their M.P.A. certificate.

The *City of London Mental Hospital* at Stone, Dartford, had an active year in 1927. Of the 161 patients admitted 72 came on a voluntary basis. The recovery-rate was 30 per cent. for the certified and 40 per cent. for the voluntary patients. The death-rate was 5·86 per cent. There were 398 private and 246 rate-aided patients on the books at the end of the year. There was not a single case of infectious disease, and the general health was good. Parties of rate-aided patients were sent to the seaside. Tiresome patients are now segregated in Newstone House, and the female infirmary ward has been divided so that recent admissions can be treated apart from other inmates. The new single rooms are furnished like ordinary bedrooms, and every possible parole is allowed. Two new wireless sets and two more ultra-violet ray lamps have been installed. The farm continues to supply all the milk, mutton, pork, eggs, poultry, and vegetables required for the hospital. A small dairy has been built and equipped. A difficulty in obtaining female nurses has now been satisfactorily overcome, and one more attendant has obtained his M.P.A. certificate. Fourteen men and 11 women nurses are now registered or certificated. The consulting staff now comprises a physician, a surgeon, a gynæcologist, an ophthalmologist, and an aurist. The Minister of Health visited the hospital in the autumn.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 28TH, 1928.

Notifications.—The following cases of infectious diseases were notified during the week:—Small-pox, 149 (last week, 173); scarlet fever, 1641; diphtheria, 926; enteric fever, 83; pneumonia, 654; puerperal fever, 54; puerperal pyrexia, 84; cerebro-spinal fever, 8; acute poliomyelitis, 8; acute polio-encephalitis, 2; encephalitis lethargica, 28; continued fever, 1; dysentery, 5; ophthalmia neonatorum, 118. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified in the following 17 counties: London, 3; Derby, 17; Devon, 3 (Plymouth); Durham, 38; Huntingdon, 1; Lancaster, 1; Leicester, 2; Norfolk, 2; Northampton, 2; Northumberland, 7; Nottingham, 5; Stafford, 11; Yorks, East Riding 6, North Riding 2, West Riding 23; Glamorgan 10; Monmouth, 15; and 1 at the Port of Southampton.

The number of patients in the Infectious Hospitals of the Metropolitan Asylums Board on July 31st–August 1st was as follows:—Small-pox, 19 under treatment, 1 under observation; scarlet fever, 1743; diphtheria, 1791; enteric fever, 39; measles, 323; whooping-cough, 194; puerperal fever, 18 (plus 11 babies); encephalitis lethargica, 71; poliomyelitis, 2; "other diseases," 20. At St. Margaret's Hospital there were 20 babies (plus 15 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox or enteric fever, 19 (5) from measles, 2 (1) from scarlet fever, 32 (5) from whooping-cough, 22 (3) from diphtheria, 53 (11) from diarrhœa and enteritis under two years, and 25 (7) from influenza. The figures in parentheses are those for London itself.

Of the 14 fatal cases of measles outside London, 9 were reported from Liverpool and 3 from Birmingham. Of the 27 fatal cases of whooping-cough outside London, 8 were reported from Liverpool, 5 from Birmingham, and 4 from Newcastle-on-Tyne. The deaths from diarrhœa were about 50 per cent. more than in the previous week.

The number of stillbirths registered during the week was 276 in the great towns (corresponding to a rate of 39 per 1000 births) including 39 in London.

Paratyphoid in the London Area.—The figures given above record a large increase over the previous week in the notifications of "enteric fever" and in the number of admissions under this head to M.A.B. hospitals. Since the return was made up upwards of 100 cases of paratyphoid B. infection have been notified in the London area, the cases for the most part being of a mild type, although one fatal result has been reported. The wide distribution suggests the infection of some common article of food, cream being under suspicion rather than the milk or water supply. The most intense centres of infection have been in Epsom and Kensington, although Wandsworth, Fulham, and Westminster have borne their share. The outbreak has been somewhat confused in the popular mind with a group of cases of food poisoning of a very different type among police officers in the Westminster area with a fatal case of toxæmia, in which death was presumed to have resulted from eating infected ham; the pathological report from King's College Pathological Laboratory confirmed this finding, but the inquest has not yet been concluded.

Reviews and Notices of Books.

THE PRESCRIBING OF SPECTACLES.

Third edition. By ARCHIBALD STANLEY PERCIVAL, M.A., M.B., B.C. Cantab. Illustrated with diagrams. Bristol: John Wright and Sons, Ltd. 1928. Pp. 239. 15s.

THIS book, which is written by an acknowledged authority on mathematical optics and on the minutiæ of spectacle prescribing, has been rewritten and enlarged. It contains much interesting matter besides the usual accounts of the optics of refraction and of the methods of testing the refraction of the eye. For retinoscopy the concave mirror is recommended on the ground that illumination is better than with the plane mirror; the author admits, however, that preference for one or the other form is to a great extent a matter of habit. The refraction of the macula can only be accurately determined in most cases with a dilated pupil, and this is specially important in myopia where the disc is liable to be tilted and the fundus stretched. For the accurate estimation of the angle of astigmatism the use of cylinders in retinoscopy is far preferable to the refraction of the two meridia by spherical lenses alone. Here the author mentions a point which is not generally known. When the correct cylinder in the trial frame is at the wrong angle the error, shown by the direction in which the shadow moves, is greatly exaggerated. This enables the surgeon to judge how to shift the axis of the cylinder until an equal shadow in all meridia is obtained. The ophthalmometer is not recommended for accurate work, since it only gives the astigmatism of the anterior corneal surface. Dr. Percival points out that tilting the lens downwards increases the spherical and still more the cylindrical power. This device may be of practical value in some cases of high myopia with astigmatism; also in prescribing temporary glasses after a cataract operation, the immediate effect of which is to cause some astigmatism with the axis horizontal. On the subject of periscopic spectacles Dr. Percival notes that the anterior convexity of a high plus lens is often too high. For instance, if a lens of +10D is to be made periscopically on a base of −7D, the anterior convexity should not be +17D but +16 D, owing to the distance from the eye. These and other details are worked out mathematically and the exact figures are given in tables. More than a third of the book is devoted to the application of mathematical optics to various practical problems in the prescribing and fitting of glasses.

FRACTURE OF THE PELVIS.

Beiträge zur Kenntnis der Beckenbrüche und Beckenluxationen. By ANDERS WESTERBORN. Upsala and Stockholm. 1928. Pp. 375.

THIS monograph is Supplement VIII. of Vol. LXIII. of the Acta Chirurgica Scandinavica and comes from the surgical clinic of the University of Upsala under the authority of Prof. Gunnar Nyström. The author wrote it in Swedish, and it has been translated into German by Dr. H. Flex. Dr. Westerborn, in his preface, states that since the introduction of X rays no thorough study of the subject has appeared and that a clinical rontgenological investigation of the material is required not only as regards the industrial efficiency of the surviving patients, but also as to their anatomical recovery and subjective symptoms. The author gives statistics of the causes of fracture in 278 cases as far as ascertainable; 143 of these were falls from a height (including eight cases of suicide by jumping out of window), 84 were caused by crushes, and the exact mechanism of injury was unknown in 34 cases, although mechanically propelled vehicles were concerned in most of them. Under the heading of "Fracture of the Pelvis" are included injuries ranging from slight to severe, some so severe that recovery is only just possible. Therefore any statistics as to prognosis are valueless unless they are classified. The gravity of a case depends largely upon the presence or absence of injury to important structures inside the pelvic cavity. Chief among these are rupture of the bladder and urethra (20 per cent. of cases). Injury to the kidneys, although included in these statistics, hardly seems attributable to pelvic fracture. Of 15 cases of rupture of the bladder eight recovered. Early operation and perineal drainage in this injury as well as in ruptured urethra is of the greatest importance as a preventive of sepsis, which is the most frequent cause of death, apart from concomitant injuries. Diagnosis of bladder rupture by the injection of sterile air and subsequent X ray photograph is strongly recommended. A tied-in catheter does not prevent the occurrence of sepsis and seems to increase the liability to stricture in cases of ruptured urethra.

The general mortality amounted to 12 per cent. of all the cases here recorded. Double vertical fracture of the pelvic ring was the most fatal (30 per cent.), while fracture of the expanded portion of the ilium was least deadly, having a mortality of only 3 per cent. 114 pages of the work are taken up by small print records of case-histories, illustrated with outlines of X ray pictures. There is a copious bibliography and 16 plates of excellent reduced reproductions of X ray photographs. There is, unfortunately, no index.

This is a very painstaking and conscientious study of the subject.

SYPHILIS.

Second edition. By HENRY H. HAZEN, A.M., M.D., Professor of Dermatology and Syphilology, Georgetown University and Howard University. London: Henry Kimpton. 1928. Pp. 643. 42*s*.

THE progress in syphilology since the first edition of this work appeared in 1919 has necessitated a thorough revision, which has been achieved with practically no alteration in size. The earlier chapters contain useful statistics of syphilis in various sections of the American population, as well as a valuable discussion on infection and immunity. Excellent accounts are given of the early stages of the disease. The cutaneous manifestations, which are classified according to the system of the American Dermatological Association, are particularly well described and illustrated; a valuable feature is the note of the histological changes in each type of lesion. The late lesions are dealt with systematically. The chapters on the vascular system and the genito-urinary tract are of a high standard and excellent coloured plates of the cystoscopic appearance of vesical lesions are included. Not many surgeons will support the author's opinion that syphilitic bone disease is a very frequent cause of spontaneous fractures, nor that the clavicle is the favourite bone for syphilitic involvement; this last statement is, moreover, at variance with the statistics given in the earlier part of this chapter. Radiographic evidence of a syphilitic lesion has frequently been noted in Charcot's joints; Dr. Hazen believes that most manifestations of this condition, *especially* those of the hypertrophic type, are due to the direct action of the spirochæte rather than of neuropathic origin. He devotes considerable space to involvement of the central nervous system, drawing special attention to the high proportion of cases of early syphilis in which this system is affected, and to the necessity of examination of the cerebro-spinal fluid. The various types of neurosyphilis in all stages are lucidly described and full details are given of the technique and value of the Lange gold chloride test. Tryparsamide does not meet with his unequivocal approval, but Dr. Hazen is very favourably impressed by the results of intraspinal treatment after the technique of Swift and Ellis, which is fully discussed. The treatment of general paralysis by malarial therapy is *dismissed* in a very cursory manner.

Readers who appreciate the full details of treatment for the various stages of the disease given in most modern works of British origin will be disappointed with the chapter on treatment. The sections on the antenatal treatment of infected women, and the treatment of congenital syphilis in infants are certainly not full enough. As to the general principles of treatment, there are evidently differences in practice between England and America. The therapeutic value of bismuth appears to us to be underrated in this book, the author's experience of a high percentage of albuminuria following the administration of this remedy being unusual. Of the organic arsenical compounds, arsphenamine is recommended as giving good results in *routine practice*; toxic effects with both neo-arsphenamine and sulfarsphenamine appear to be more frequent than with similar preparations of European origin. The simultaneous administration of arsenical compounds and metallic remedies is not recommended.

Throughout the book Dr. Hazen quotes freely from authoritative sources, and gives extensive lists of references at the end of each chapter; he would have done well also to make clear his own opinion, based on personal experience, especially where controversial questions are involved. Students and practitioners will miss this guidance, but will appreciate the impartiality which characterises what is on the whole an excellent work.

DEAFNESS AND ITS ALLEVIATION.

By VINCENT NESFIELD, F.R.C.S., Major I.M.S. (ret.); Ophthalmic Surgeon, Queen's Hospital for Children. London: H. K. Lewis and Co., Ltd. 1928. Pp. 85. 7*s*. 6*d*.

UNDER this title Mr. Nesfield sets out to describe an operation he has designed for the relief of deafness. This consists in gouging away the bone to make a channel 14 mm. in diameter parallel to, and behind, the external auditory canal. The aim in view is to produce an aperture into the middle ear about 5 mm. in diameter. According to the author's description, this "boring" leads into the attic of the middle ear; the mastoid antrum is usually "non-existent, or only present as a thin red line of mucous membrane." The bridge between the "boring" and the external auditory canal is cut away to a depth of about 10 mm., and the external meatus split to make a flap, which is stitched to the under surface of the skin incision. Two tubes, 5 mm. in diameter, are inserted from the meatus backwards into the canal made in the mastoid; these are removed on the next day, and firm plugging inserted and renewed daily for three weeks with the object of keeping the opening patent. Nevertheless, the skin opening nearly always closes over at the back of the external auditory meatus; in time a very thin membrane forms *in this* situation. Mr. Nesfield claims that the operation improves the hearing in six different ways: (1) by rendering the Eustachian tube patent; (2) by allowing air to enter the middle ear directly through the *new* opening, "and this appears to be the most potent factor"; (3) sound waves impinge on the membrane which forms over the new opening; (4) the *channel* not only aerates the middle ear but drains it of mucus; (5) the boring and the increased vascularity resulting in the healing process produce a reflex effect on the cochlea; and (6) the increase of the total space of the middle ear increases the resonance. As to (1) he does not attempt to explain how or why this effect is attained. The benefit claimed in (2) cannot occur when the opening closes over as, on his own showing, it nearly always does; this criticism applies also to (4), while (5) is a highly speculative statement.

The book appeals rather to the general public than to the medical profession; thus, of its 85 pages, but 14 are devoted to a description of the operation, its after-treatment, and its results, while the previous 56 pages contain a popular account of the anatomy and physiology of the ear, and of "the nature of deafness." The author says that, as it is not possible to gauge the result under three years, it is difficult to show exact results. It may be difficult, but it is surely not impossible, to show the approximate results on all patients operated on three years and more ago. Such tables of the results of treatment have been compiled by other authors of novel methods, and the profession has a right to expect some attempt to show the result in all cases treated by one who makes large claims to alleviate such a disease as chronic deafness.

ACCIDENTS, AND PROBLEMS ARISING THEREFROM.

Lehrbuch der Unfallheilkunde. By Dr. PAUL JOTTKOWITZ, Oberregierangsmedizinabrat, Chief of the Orthopædic Installation, Berlin. Munich: J. F. Lehmann. 1928. Pp. 280 M.15.

THAT this book must cover a great deal of ground is evident when we reflect on the immense variety of injuries that result from accidents. No work quite like it has appeared in this country, where information has to be collected laboriously from text-books on medicine, surgery, orthopædics, and jurisprudence. In Germany, the pioneer country of workmen's insurance, quite a literature has grown up of which this volume is representative. The treatment of injuries is not considered in detail, but their disabling effects are discussed fully, and also the difficult subject of the estimation of wage-earning capacity after crippling injuries or loss of parts. In this last connexion, amputation sites and artificial limbs come under review. The extent of the field will be indicated by the quotation of some of the headings, which range from accident insurance, infected wounds, animal infections such as glanders, tuberculosis, diabetes, acromegaly, and arthritis, to artificial limbs. This work is in some sort an epitome of medicine and surgery from an industrial insurance point of view, the diseases of the special senses being excluded. It is of considerable medico-legal value, and certainly should be studied by medical officers concerned with the relations between patients and employers.

DISEASES OF THE BLOOD AND BLOOD-BUILDING ORGANS.

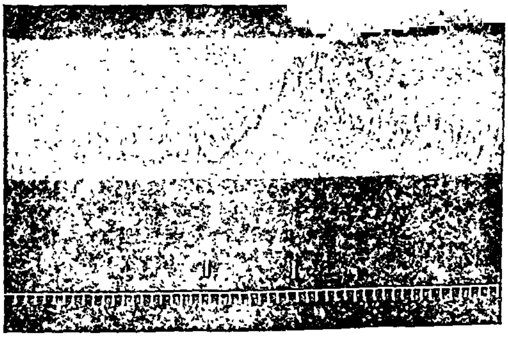
Clinical Pediatrics. Vol. XI. By WILLIAM PALMER LUCAS, M.D., Professor of Pediatrics and ALFRED H. WASHBURN, M.D., Instructor in Pediatrics, University of California Medical School. Supervising Editor, ROYAL STORRS HAYNES, M.D., Clinical Professor of Diseases of Children, College of Physicians amd Surgeons, New York. London and New York: D. Appleton and Co., Ltd. 1928. Pp. 233. 16*s*.

DISEASES *of the blood and blood-forming system* form a small but important division of the ills of children. In this substantial volume there is no padding, and an admirable feature is the inclusion of illustrative cases. These are all well chosen and are worthy of close study by those concerned with the diseases of children and adults alike. The peculiarities of the blood picture in children, both in health and disease, are well described; the sections on the diagnosis and treatment of the various conditions are satisfactory, but the pathological side might well have been further elaborated.

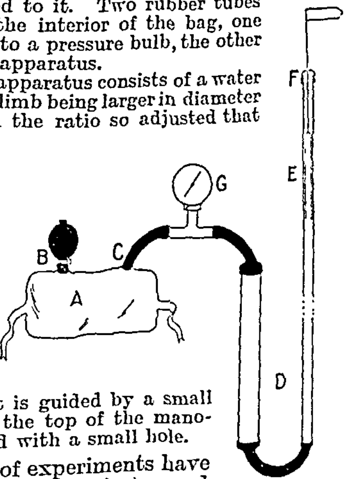
New Inventions.

APPARATUS FOR RECORDING HUMAN BLOOD PRESSURE.

HITHERTO it has been impossible to obtain continuous records of human blood pressure with simple apparatus. Erlanger[1] obtained short continuous records at intervals, but the only apparatus devised for taking continuous records is a complicated apparatus employing an electric valve invented by Kolls in 1920.[2] Moreover, this apparatus did not record rapid variations in blood pressure. Consequently, much important work in relation to variations in blood pressure in human subjects under different conditions either has had to be omitted or has been performed by difficult and unreliable means. The simple apparatus about to be described is a step towards remedying this lack. As will be seen, it is a combination of some well-known apparatus slightly modified, and the instrument is obviously an object for improvement. It consists of two sections.


Continuous human blood-pressure record, showing the effect of respiratory cessation in the inspiratory position. Time intervals 5 secs.

1. An armlet made of a collapsible rubber bag (A), the outer surface of one side being made rigid by means of stiff canvas attached to it. Two rubber tubes communicate with the interior of the bag, one (B) being connected to a pressure bulb, the other (C) to the recording apparatus.
2. The recording apparatus consists of a water manometer (D), one limb being larger in diameter than the other, and the ratio so adjusted that one millimetre of mercury difference in actual blood pressure moves the liquid in the recording limb of the manometer an equal distance. To record on smoked paper, a special glass float (E), carrying a light celluloid pointer, is used. The stem of the float is guided by a small glass cap (F) fitting the top of the manometer and perforated with a small hole.



A large number of experiments have been done on human subjects, and the best procedure has been found to be as follows. The armlet is arranged immediately above the elbow, and the subject sits or lies with the arm supported in a comfortable position. The pressure in the bag is raised to 20–25 mm. Hg below the subject's systolic pressure. The requisite tension in the bag to produce this pressure can be ascertained by inserting a small meter (G) in a by-tube. In this way, 10-minute continuous records can be obtained without the subject experiencing any discomfort. It should be pointed out that the apparatus does not record systolic blood pressure but variations in blood pressure. By employing a simple factor the actual blood pressure can easily be ascertained if desired. The tension in the bag is, of course, considerably above the venous blood pressure and, consequently, volume effects are excluded. A typical tracing obtained with this apparatus is shown.

J. H. THOMPSON, B.Sc.,
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[1] Erlanger, J.: Jour. Labor. and Clin. Med., 1926, xii., No. 2, 172.

[2] Kolls, A. C.: Jour. Pharmacol. and Exper. Therap., 1920, xv., 433.

THE LANCET.

LONDON: SATURDAY, AUGUST 11, 1928.

HE INTERNATIONAL UNIT OF X RAYS.

AT the First International Congress of Radiology, ld in London three years ago, there was a discussion the necessity of establishing an international unit be used as the basis of all X ray measurement of sage. It was felt at the time that satisfactory ogress in treatment with X rays would not be ssible without a unit which could be universally lopted. It was therefore resolved that an Inter- tional X Ray Unit Committee be formed, and the ritish X Ray Unit Committee, which was established 1923, was requested to communicate with the ysical and radiological societies of the principal untries throughout the world with a view to the mination of representatives to constitute such an ternational committee. During the last three years e British X Ray Unit Committee has had the matter hand and a committee consisting of two representa- es from each of 19 different countries has been rmed. Each country was invited to submit the mes of two representatives—one a medical man d one a physicist—to serve on this committee. preserve a balance, the British Empire was repre- ted by two members only.

The representatives were invited to submit their ws on the X ray unit and the measurement of sage, and it was at once evident from the replies eived that the subject was one in which great erest was taken. A summary of the various points sed was prepared and submitted as a basis for cussion at a meeting of the International X Ray it Committee which met during the Second Inter- tional Congress of Radiology held last week at ckholm. Representatives from the following ntries were present at the meeting: Belgium, cho-Slovakia, Denmark, Great Britain, France, rmany, Italy, Japan, Norway, the United States America, Russia, Spain, Sweden, and Switzerland. is gratifying to know that unanimous agreement arrived at in the committee meeting concerning main points under discussion. The following mmendations put forward by the International mittee were unanimously adopted at a general eting of the Congress:—

. That an international unit of X radiation be pted.

. That this international unit be the quantity of radiation which, when the secondary electrons are y utilised and the wall effect of the chamber is ided, produces in 1 c.cm. of atmospheric air 0° C. and 76 cm. Hg pressure such a degree of ductivity that one electrostatic unit of charge measured at saturation current.

. That the international unit of X radiation be led the "Rontgen," and that it be designated by letter R.

. That various standard methods be employed to ablish the unit.

. That for all comparative purposes it is advisable employ ionisation chambers which have been ibrated in terms of a standard chamber for radiation of the various qualities employed. It is advisable to make the wall effect of these chambers mall as possible.

6. That the practical instrument used to measure X ray output be called a dosage meter.

7. That the constancy of the indications of the dosage meter be tested by means of gamma radiation emitted from a definite quantity of radium element, the measurement being carried out always under the same conditions.

8. That any specification of dosage is incomplete without specifying the quality as well as the quantity of the radiation. The quality of X radiation used for practical purposes is very varied and it would be impracticable to give a complete specification of it; but much information can be obtained from a knowledge of the degree of absorption of the radiation in standard materials, the peak voltage applied to the tube together with the filter employed, and the general character of the high tension apparatus. For practical purposes the quality may be expressed by stating the half value layer in a suitable material or by stating the effective wave-length as determined by the percentage amount of radiation transmitted through a given thickness of a suitable material (copper or aluminium).

In view of the fact that rapid progress is being made in methods of X ray measurement and in our knowledge of X ray phenomena, the Committee felt that the above recommendations should be regarded as provisional. They may be modified later in the light of further information. The adoption of the resolutions marks an important step in the measurement of X ray dosage. Not only will the confusion which has hitherto existed in radiology by the employment of the letter R to denote entirely different quantities be removed, but it will now be possible for a radiologist in one country to reproduce accurately an X ray dose and thus be enabled to compare his results with those of radiologists in other countries. Hitherto this has been impossible since there has been no international agreement concerning the unit in terms of which the dose should be measured. Emphasis has been laid on the need for specifying the quality as well as the quantity of radiation employed in treatment. The recommendations indicate how the quality may be specified, and it would be well in order to obtain as close agreement as possible if radiologists were to employ the methods suggested. The correlation of the physical dose and the biological dose needs careful consideration by the International Committee as it presents many difficulties. Whether these difficulties can be surmounted and a correlation be found is still an open question.

The International X Ray Unit Committee has been authorised to continue its deliberations and to submit a further report for consideration at the next Congress to be held in Paris in 1931. Prof. K. M. G. SIEGBAHN (Upsala) was elected chairman, and Prof. E. A. OWEN (Bangor) and Prof. HERMANN HOLTHUSEN (Hamburg) honorary joint secretaries of the International Committee during the ensuing three years. The British X Ray Unit Committee, which has had the financial support of the Medical Research Council, is to be heartily congratulated on the excellent work it has done during the last three years in preparing the way for the adoption of the resolutions by the Second International Congress of Radiology.

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DISSOCIATED JAUNDICE.

SINCE the observations of certain French biochemists called attention to the fact that the elimination of bile-salts and of bile-pigments do not necessarily run a parallel course in certain cases of icterus, the study of so-called dissociated jaundice has been actively pursued by many observers. A recent article by CHABROL, BÉNARD, and BARIÉTY[1] gives an account of the researches carried out by them during the last nine years on the excretion of bile-salts. The detection of bile-salts is fairly easy, but the quantitative estimation of these bodies either in urine, blood serum, or even in bile itself is a matter of great difficulty. Thus in blood serum these authors have found it impossible to obtain an estimate of the amount of bile-salts present by any method depending on diminution of surface tension. They have, however, been able to apply a modification of Pettenkofer's reaction which will give a positive result in dilutions as great as 1 in 10,000. In the case of urine, Pettenkofer's reaction has also been employed, but here surface-tension estimations have proved of value when carried out by a special technique. It has been found that the NaCl-content of the fluid is of importance, since the concentration of this salt may produce considerable modifications in the results obtained. When duodenal secretions, recovered by means of a duodenal tube, are examined, the estimation of the bile-salts is a simple matter as these bodies are always present in considerable concentration. The French observers have found that methods of estimating surface tension are the most readily applicable in this medium and give results of great utility, even if no claim to fine exactitude can be made. The principal conclusions drawn from their observations are as follows:—

(1) In normal circumstances, bile-salts can never be found except in the first part of the small intestine, the duodenal fluid giving figures in the neighbourhood of 15 g. per litre. The authors have given the name of biliary index to the ratio salts/pigments, and find that this index is normally in the region of 40. In the blood serum they are able to assert that if bile-salts are ever present in physiological conditions their concentration is certainly below 0·1 g. per litre, and as regards the urine they are again unable to find any evidence of the presence of these bodies normally.

(2) In the case of hæmolytic jaundice, the findings are comparable to those in the normal—i.e., bile-salts cannot be found in the blood serum and they do not lower the surface tension of urine. Duodenal tubage, on the other hand, gives a ready demonstration of the dissociation which is held to be present in jaundice due to excessive hæmolysis, the biliary index in such cases being as low as 6 instead of the normal 40.

(3) In obstructive jaundice bile-salts should theoretically be found with the greatest facility. Some 10–15 g. of bile-salts are normally excreted daily in the bile, and in cases of grave obstruction to the biliary passage it would be expected that a large part of this would appear in the urine, but such does not appear to be the case. In a series of 15 cases of grave obstructive jaundice, the authors have been surprised to find in the blood serum only the smallest trace of the bile-salts in spite of the presence of a high concentration of bile-pigments in the blood. In reality, the proportion of bile-salts was ten times less than that of pigments, whereas in normal bile these proportions are reversed. The first possible explanation of this fact is that the renal threshold for bile-salts is much lower than that for bilirubin. The study of the urine in such cases does not support this thesis, for whenever the concentration of bile-salts in the urine is measured, it is found that the amount eliminated in obstructive jaundice is relatively small, and there have often been cases of obstructive jaundice in which the pigmentation was of the deepest degree, and yet the urine showed an almost complete absence of bile-salts.

The conclusion is drawn that any icterus which goes on for a long time tends to be accompanied with a disassociation of the amount of bile constituents excreted, the pigments being the elements showing extreme retention. According to the theory of
LEMIERRE and BRULÉ, such a condition, in wh
Hayes's reaction is negative, in spite of an inte
choluria, indicates dysfunction of the hepatic cells,
following CHABROL, BÉNARD, and BARIÉTY, the
explanation would appear to be that there is a gen
deficiency of bile-salts in the organism in these ca
and they base this belief on the fact that the small qu
tities of bile which can be recovered by duodenal tub
in such circumstances demonstrate a consider
diminution in the relative content of bile-salts.
explain such a disappearance of bile-salts from
bile itself they have recourse to the fact that ch
sterol is noticeably increased in the blood in all th
circumstances, and they hold that it is possible
this increase of blood cholesterol is in part due
failure of the liver to form bile-salts. Apart from
the fact that the normal circulation of bile-salts f
the liver to the intestine and then back by the po
vein to the liver has been interrupted by the pres
of an obstruction, is thought to be sufficient to b
about a steady diminution in the bodily reserve
bile-salts.

In conclusion, these authors have attempted
discover whether there are not frequently variation
the excretion of bile-salts amongst patients suffe
from diseases unaccompanied by jaundice. Here, ag
caution must be observed because the surface ten
of urine can be materially affected by many bo
in addition to bile-salts—chlorides, albumin,
polypeptides being outstanding examples. In m
cases of secondary carcinoma of the liver, and du
the course of certain acute infections, observation
the surface tension, together with a modified Pet
kofer's reaction, point to the possibility of an exces
excretion of bile-salts. These findings must, howe
be accepted with reserve. Still more interesting
certain observations on the effect of injecting an ex
of bile-salts into the blood, it being found that
intravenous injection a concentration much hig
than that ever observed during biliary obstruc
can be produced without any accompanying pru
or bradycardia.

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ACTIONS AGAINST GOVERNMENT DEPARTMENTS.

GOVERNMENT departments are far from enjoyin
good press at the moment. Judges abuse them
well-reported phrases; Prof. J. H. MORGAN has b
attacking them in two articles in a popular even
newspaper; the Lord Chief Justice is understood
be devoting the Long Vacation to preparing
publication a book in criticism of bureaucra
Though it is not unknown at public dinners for
civil service to hear itself praised for its compete
integrity, and self-effacement, there are plenty
cases (especially during war time) where Governm
departments have deserved the condemnation t
have received. In one sense bureaucracy is increas
and must increase. The manifold activities of
Home Office and the Ministry of Health—in s
directions as the inspection of factories, the notifi
tion of diseases, and the general supervision of hea
services—are in a measure an infringement of perso
liberty. But it is too late to say that Governm
departments are not to interfere in these matt
On the other hand, the departmental attitude
easily exceed what is reasonable, especially in
absence of legal check. The medical profession m
not be specially concerned, but it remembers
difficulties when panel doctors found the Minister
Health exercising not only executive but also judic

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[1] Presse Méd., July 7th, p. 849.

functions and seeking to bar the avenue of appeal to the law courts. As a member of the public, too, the practitioner may be surprised at the results of the doctrine that the King can do no wrong. A doctor's motor-car may be smashed by a negligently driven Army lorry and the only remedy may be a futile claim against the corporal at the steering-wheel. Or, if a postman steals a registered and insured postal packet, it may turn out that the compensation is merely discretionary not contractual. It is not unimportant, therefore, to inquire the nature of the legal liability of State departments and to consider possible reforms.

Mr. J. W. GORDON, K.C., has recently published a pamphlet on "The Crown and the Courts" (Stevens, 1*s.*), setting out the case for reform illustrated by instances and judicial comments. His examples of the sins of Government departments are set out under several heads such as "usurpation of authority," "trespass to property," "imposition of unauthorised taxation," and "delay or denial of justice"—a damning list which suggests that the time has come for a fresh Magna Charta. The difficulty is at present that the Crown is immune from liability for the wrongful acts of its servants. Petition of Right will not lie for what the lawyers call a tort. There is some doubt whether this rule is historically well founded, but it is solidly established to-day and nothing but a new statute could upset it. In at least one of our self-governing Dominions the rule does not exist. Under an Act of 1903 the Commonwealth of Australia can be made responsible for the actions of its officers just as a master can be made liable for the actions of his servants. Australia has abolished the complicated and anachronistic procedure by way of Petition of Right and has put the subject when suing the Crown in no worse position than if he were suing another subject. Something of the kind is required in England. The obsolete procedure and the one-sided prerogative ought to be modernised and modified. After the war a strong committee was appointed by Lord BIRKENHEAD, when Lord Chancellor, to consider the position of the Crown as litigant and to prepare a Bill to amend the law as found desirable. After long delay, as Mr. GORDON says, a Bill was produced more than a year ago but nothing more has been heard of it. It may be urged that the matter is complicated and not free from controversy. The departments naturally fear a multitude of petty claims—for example, if the Admiralty carries out big gun firing near the coast and windows are broken. Nevertheless, it is understood that most of the Government departments are prepared to accept the Bill. Little will be done unless public opinion applies pressure. Mr. GORDON'S pamphlet is therefore timely, and those who wish to pursue the matter beyond the mere collecting of anthologies of judicial abuse of Government departments should study the draft Bill which was published as Cmd. 2842 in April, 1927.

AN International Conference on Light will be held at Lausanne and Leysin from Sept. 10th to 13th next. Those taking part will include Prof. H. C. Dorno (Davos), Prof. C. Fabry (Paris), Prof. V. Henri and Prof. Bloch (Zurich), Dr. Leonard Hill (London), Prof. Hausmann (Vienna), Dr. Alfred Hess (New York), Prof. Axel Reyn (Copenhagen), and Dr. A. Rollier (Leysin). Among the subjects to be discussed are the methods of measuring the energy and biological activity of light rays, irradiated foods and sterols, the climatic and light therapy of various forms of tuberculosis. Dr. G. Murray Levick is acting as general honorary secretary of the Conference in England, but all entrance fees and general inquiries should be addessed to the Secrétariat-général de la Première Conférence Internationale de la Lumière, Lausanne, Switzerland.

Annotations.

"Ne quid nimis."

THE DIAGNOSIS OF TUBERCLE IN GENERAL PRACTICE.

THE diagnosis of consumption presented no difficulty to the practitioner of 50 years ago. If cough, blood-spitting, wasting, night-sweats, and hectic flush proclaimed the disease the patient's friends were advised that he was in a state of consumptive decline, and the verdict was received as a sentence of death. The customary precautions were taken to postpone, as far as might be, the inevitable end. The dangers of fresh air were met by closed windows whose crevices were further sealed by crimson covered bolsters filled with sand. The bed was screened by heavy curtains, scarcely withdrawn to permit access to the sufferer. The patient's resistance was supported by drugs liberally prescribed, and blood-letting was resorted to in extremity. When the end came, both doctor and relatives had the satisfaction of knowing that everything possible had been done, and bowed themselves before the mysterious dispensations of Providence.

We know to-day that the symptoms and signs on which the doctors of a previous generation relied for diagnosis represent the last stages of disease and indicate as certainly as in the days of the younger Dumas the near approach of death. The importance of diagnosis at a much earlier stage as offering the only hope of cure has been emphasised by every teacher since the day when Koch made his great discovery. Indeed an almost morbid care has been exercised in the attempt to discover the earliest possible signs of tuberculosis. Great importance has been attached to almost imperceptible variations in breath sounds, and the skill of a piano-tuner demanded to determine relative changes in the percussion note of the lung apices. In recent years thousands of persons have been stigmatised as tuberculous and admitted to sanatoriums, where they have received treatment for non-existent disease, and been saved from a peril that never threatened. A more rational appreciation of the nature of tuberculosis, and in particular of the distinction between infection and disease, has led to a more reasonable attitude on the part of those specially interested in the care of the tuberculous. But the general practitioner, mindful of the teachings of his student days, and aware of some change in the modern attitude, remains in doubt as to the course he should pursue when confronted by a doubtful case. Any lack of acuity on his part may deprive his patient of the only chance of cure, while over-scrupulous care may awake groundless fears and pave the way to chronic invalidity. A false step on his part may not only involve a period of needless inactivity for his patient, it may be responsible for either of those twin obsessions, the dread of the phthisophobic or the craving of the phthisophilic. The latter condition is perhaps more common than the former.

Dr. Lawrason Brown, of Saranac Lake, has endeavoured[1] to clear the air by setting up a diagnostic standard representing the minimal requirements for diagnosis. If he has erred it is on the side of boldness, but he has undoubtedly turned the hose of common sense on the sacrificial fires of the phthisical expert, and the practitioner whose hand may have lost some of its cunning and whose ears are slightly dulled by the passage of time will be grateful to him. His diagnostic criteria are: (1) hæmoptysis of a drachm or more; (2) pleurisy with effusion; (3) moderately coarse râles above the third rib and the third vertebral spine; (4) a parenchymatous Rontgen ray lesion in the same area; and (5) tubercle bacilli in the

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[1] Jour. Amer. Med. Assoc., 1928, xc., 1032.

Bénard, and Bariéty[1] gives an account of the researches carried out by them during the last nine years on the excretion of bile-salts. The detection of bile-salts is fairly easy, but the quantitative estimation of these bodies either in urine, blood serum, or even in bile itself is a matter of great difficulty. Thus in blood serum these authors have found it impossible to obtain an estimate of the amount of bile-salts present by any method depending on diminution of surface tension. They have, however, been able to apply a modification of Pettenkofer's reaction which will give a positive result in dilutions as great as 1 in 10,000. In the case of urine, Pettenkofer's reaction has also been employed, but here surface-tension estimations have proved of value when carried out by a special technique. It has been found that the NaCl-content of the fluid is of importance, since the concentration of this salt may produce considerable modifications in the results obtained. When duodenal secretions, recovered by means of a duodenal tube, are examined, the estimation of the bile-salts is a simple matter as these bodies are always present in considerable concentration. The French observers have found that methods of estimating surface tension are the most readily applicable in this medium and give results of great utility, even if no claim to fine exactitude can be made. The principal conclusions drawn from their observations are as follows:—

(1) In normal circumstances, bile-salts can never be found except in the first part of the small intestine, the duodenal fluid giving figures in the neighbourhood of 15 g. per litre. The authors have given the name of biliary index to the ratio salts/pigments, and find that this index is normally in the region of 40. In the blood serum they are able to assert that if bile-salts are ever present in physiological conditions their concentration is certainly below 0·1 g. per litre, and as regards the urine they are again unable to find any evidence of the presence of these bodies normally.

(2) In the case of hæmolytic jaundice, the findings are comparable to those in the normal—i.e., bile-salts cannot be found in the blood serum and they do not lower the surface tension of urine. Duodenal tubage, on the other hand, gives a ready demonstration of the dissociation which is held to be present in jaundice due to excessive hæmolysis, the biliary index in such cases being as low as 6 instead of the normal 40.

(3) In obstructive jaundice bile-salts should theoretically be found with the greatest facility. Some 10–15 g. of bile-salts are normally excreted daily in the bile, and in cases of grave obstruction to the biliary passage it would be expected that a large part of this would appear in the urine, but such does not appear to be the case. In a series of 15 cases of grave obstructive jaundice, the authors have been surprised to find in the blood serum only the smallest trace of the bile-salts in spite of the presence of a high concentration of bile-pigments in the blood. In reality, the proportion of bile-salts was ten times less than that of pigments, whereas in normal bile these proportions are reversed. The first possible explanation of this fact is that the renal threshold for bile-salts is much lower than that for bilirubin. The study of the urine in such cases does not support this thesis, for whenever the concentration of bile-salts in the urine is measured, it is found that the amount eliminated in obstructive jaundice is relatively small, and there have often been cases of obstructive jaundice in which the pigmentation was of the deepest degree, and yet the urine showed an almost complete absence of bile-salts.

The conclusion is drawn that any icterus which goes on for a long time tends to be accompanied with a disassociation of the amount of bile constituents excreted, the pigments being the elements showing extreme retention. According to the theory of Lemierre and Brulé, such a condition, in which Hayes's reaction is negative, in spite of an intense choluria, indicates dysfunction of the hepatic cells, but following Chabrol, Bénard, and Bariéty, the true explanation would appear to be that there is a general deficiency of bile-salts in the organism in these cases, and they base this belief on the fact that the small quantities of bile which can be recovered by duodenal tubage in such circumstances demonstrate a considerable diminution in the relative content of bile-salts. To explain such a disappearance of bile-salts from the bile itself they have recourse to the fact that cholesterol is noticeably increased in the blood in all these circumstances, and they hold that it is possible that this increase of blood cholesterol is in part due to a failure of the liver to form bile-salts. Apart from this, the fact that the normal circulation of bile-salts from the liver to the intestine and then back by the portal vein to the liver has been interrupted by the presence of an obstruction, is thought to be sufficient to bring about a steady diminution in the bodily reserves of bile-salts.

In conclusion, these authors have attempted to discover whether there are not frequently variations in the excretion of bile-salts amongst patients suffering from diseases unaccompanied by jaundice. Here, again, caution must be observed because the surface tension of urine can be materially affected by many bodies in addition to bile-salts—chlorides, albumin, and polypeptides being outstanding examples. In many cases of secondary carcinoma of the liver, and during the course of certain acute infections, observations of the surface tension, together with a modified Pettenkofer's reaction, point to the possibility of an excessive excretion of bile-salts. These findings must, however, be accepted with reserve. Still more interesting are certain observations on the effect of injecting an excess of bile-salts into the blood, it being found that by intravenous injection a concentration much higher than that ever observed during biliary obstruction can be produced without any accompanying pruritus or bradycardia.

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ACTIONS AGAINST GOVERNMENT DEPARTMENTS.

Government departments are far from enjoying a good press at the moment. Judges abuse them in well-reported phrases; Prof. J. H. Morgan has been attacking them in two articles in a popular evening newspaper; the Lord Chief Justice is understood to be devoting the Long Vacation to preparing for publication a book in criticism of bureaucracy. Though it is not unknown at public dinners for the civil service to hear itself praised for its competence, integrity, and self-effacement, there are plenty of cases (especially during war time) where Government departments have deserved the condemnation they have received. In one sense bureaucracy is increasing and must increase. The manifold activities of the Home Office and the Ministry of Health—in such directions as the inspection of factories, the notification of diseases, and the general supervision of health services—are in a measure an infringement of personal liberty. But it is too late to say that Government departments are not to interfere in these matters. On the other hand, the departmental attitude can easily exceed what is reasonable, especially in the absence of legal check. The medical profession may not be specially concerned, but it remembers its difficulties when panel doctors found the Minister of Health exercising not only executive but also judicial infectious disease seems hardly greater than might be expected in a random sample of the child population. All the cases made a good recovery without operation.

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[1] Presse Méd., July 7th, p. 849.

ETHYLENE IN THE OPERATING THEATRE.

ETHYLENE for general anæsthesia has not in this country received the welcome with which it apparently continues to be greeted in America, and in the most recent contributions to the subject[1] we find nothing to make our views more favourable towards its use. The writers, having claimed ethylene as "one of our best general anæsthetics"—which for short operations we may grant them as a correct description—proceed to discuss the explosibility of the gas. In saying that this should not be ignored, they find that ethylene "differs very little from ether in this respect," but later demonstrate how great the difference actually is by detailing the precautions that should be observed to avoid explosion during the use of ethylene. Although these precautions are described as "not burdensome," they appear to outweigh any of the advantages demonstrated for the use of ethylene. The system for avoiding danger "available at little expense and trouble" involves insulated copper wire running along the gas tubes, metallic paint for covering the rubber bags (which must each contain about a pint of water), and a moist cloth attached to the metal frame at the back of the apparatus. "Any potential set up by the gas escaping under high tension through the reducing valves or by friction in the rubber tubes is at once grounded before the mixing of the ethylene and oxygen." The outside of the rubber tube is coated with the metallic paint. Within the tube is a bare spiral copper wire soldered to metal at each end. "It has also seemed advisable to solder a connexion to the metallic spiral in the wall of the rubber tube." Before each operation water is run through the tube. The anæsthetist's feet rest on a moist cloth, or he sits on a stool attached to a moist cloth. A special system of grounding must be worked out based on the fact that cement and tile are good conductors, but wood, linoleum, and rubber-covered floors are poor conductors. After studying the precautions required for the safe administration of ethylene according to these authors, we are left in doubt whether the anæsthetist should be best qualified as a fireman, an architect, or an electrical engineer.

PUBLIC HEALTH CONGRESS AND EXHIBITION.

A CONGRESS will be held at the Royal Agricultural Hall, London, during the week Nov. 19th to 24th, under the auspices of the various British municipal associations interested in public health administration. The congress will be formally opened on the Monday with an address by the Minister of Health, and on the afternoon of the same day Sir George Newman will speak on the purpose of the public health services. On Tuesday morning Sir Walter Fletcher will deal with research in relation to public health, and in the afternoon Dr. C. H. Bond with local organisation for the prevention and treatment of mental disorders. Housing and milk-supply will occupy the attention of the congress on Wednesday, the introducers being Mr. E. D. Simon and Mr. Wilfred Buckley. Thursday will be given up to water-supply and sewage, the principal speakers being Prof. W. J. Wilson, of Belfast, Mr. J. H. Coste, chief chemist to the London County Council, and Mr. John Gardner, of the West Riding Rivers Board. On Friday morning the new medical officer of health for the city of London, Dr. W. M. Willoughby, will speak on food protection, to be followed in the afternoon by Mr. R. H. P. Orde on the construction and equipment of hospitals. The final day of the congress will be given up to the subject of town cleansing. Official delegates to the number of many hundreds have been appointed, and their expenses will be paid by their local sanitary authorities. In the congress hall an exhibition will be held throughout the week, conducted on lines similar to that of the Public Works, Roads and Transport exhibit organised for many years past by Messrs. May and Pattisson, of 13, Victoria-street, London, S.W. 1.

FOOT-AND-MOUTH DISEASE.

FOOT-AND-MOUTH disease is of special interest to the pathologist, as its virus readily passes the pores of a fine porcelain filter, and the susceptibility of the guinea-pig to its action makes the disease a favourable subject for experimental research. The report[1] which has just appeared deals almost exclusively with the disease in small laboratory animals. Improved accommodation for large farm animals has, however, now been completed, and the experimental results obtained with guinea-pigs can be further tested on cattle, sheep, and pigs. The work on which the report is based (set out in three appendices) has been carried out at the Laboratory of the Ministry of Agriculture by Dr. F. C. Minett, at the Lister Institute by Dr. H. B. Maitland, Dr. T. Hare, Mrs. Y. M. Burbury, and Mrs. M. C. Maitland, and at the National Institute for Medical Research by Mr. J. A. Galloway and Dr. S. Nicolau. Mention is also made of research undertaken at the Lister Institute by Prof. A. Ciuca, of Bucharest. A fourth appendix contains a bibliography of work published since the last report appeared. An introduction contains brief reference to important recent work in other countries.

Lebailly and Vallée have noted the early appearance and rapid decline of infectivity in this disease in cattle, and the report contains evidence that active virus cannot as a rule be detected in the lesions of guinea-pigs beyond the third or fourth day after inoculation, though it was found by Dr. Hare in the apparently healthy skin of the ears as late as the tenth day. The results are similar to those obtained by Reppin who could not recover virus from the mouth in cattle later than the eleventh day after infection. Such observations contrast with the prolonged infectivity of the skin and mouth lesions and of the bone-marrow in the dead body, which have been shown to retain active virus for several weeks or even months if the animal has been killed during the infective period and the carcass kept at a low temperature. The viability of the virus on inanimate objects has been further investigated, and survival in vesicle fluid dried on glass and kept in a desiccator at 18° C. for at least two years is recorded. When dried on bran and kept under more natural conditions in the open air of the laboratory the virus has been found active after 40 weeks. Existing evidence therefore points to fomites rather than carriers as the reservoir of infection. Dr. Minett has tested the disinfectant action of a large number of substances, and finds that both acids and alkalis when highly diluted are very destructive to the pure virus; in the presence of organic matter they are much less effective. A 1 : 1000 solution of formalin sprayed on hay was capable of disinfecting it without making it unpalatable as fodder. Mrs. Burbury found that a temperature between 50° and 60° C. rendered inactive the virus contained in liquids, and that an orderly relation existed between temperature, time, and the concentration of the virus similar to that found in the case of bacterial emulsions. The duration and degree of immunity of the guinea-pig and the factors responsible have been examined, and a fairly close relation between the content of antibodies in the blood and the degree of resistance of the animal has been found to exist. It was recorded in an earlier report that a certain degree of active immunity resulted from inoculation with a vaccine consisting of virus killed with formalin. The effect of such a vaccine on the resistance of guinea-pigs has been studied, and confirmation of the previous results has been obtained.

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[1] Amer. Jour. Surg., June, 1928.

[1] Ministry of Agriculture and Fisheries. Third Progress Report of the Foot-and-Mouth Disease Research Committee. H.M. Stationery Office. 1928. 5s. Pp. 141.

sputum. He claims that careful attention to these points will enable a correct diagnosis to be made in about 98 per cent. of all doubtful cases. Taking Dr. Brown's criteria seriatim—

(1) It will be noted that for significant hæmoptysis Dr. Brown postulates an amount of blood of not less than a teaspoonful. He thus excludes those cases of "coloured" or "streaky" spit which, except in cases of chronic fibroid phthisis, are usually due to causes other than tubercle. We might add that a hæmoptysis which the patient delights to describe is seldom tuberculous in origin, while one which he strives to minimise or attribute to epistaxis is almost invariably of sinister import.

(2) Pleurisy with effusion should obviously be treated as tuberculous unless some other cause is manifest, while dry pleurisy should at least be regarded as a danger signal.

(3) The significance of râles is usually appreciated, but the old and incorrect teaching that tubercle usually commences in the lung apex may lead to error. The signs of the graver types of phthisis, especially in the young, are usually found below the clavicle. The true apex of the lung is more often the site of abortive disease. A careful examination of the axillary regions may reveal crepitations when the upper half of the lung, both anteriorly and posteriorly, is apparently free. The necessity of auscultation over the lateral walls of the chest is too frequently forgotten.

(5) The importance of repeated examinations of the sputum for tubercle bacilli cannot be exaggerated. The failure to apply this simple test is responsible for more errors in diagnosis than all other causes put together. If five examinations at weekly intervals yield a negative result, the practitioner may regard the future of his patient with some degree of equanimity. There are exceptions to every rule, and all the circumstances of the case must be taken into account, but the records of any dispensary will show that, provided a conscientious search for tubercle bacilli has failed to discover the bacillus in the first instance, only in rare cases will a positive finding be forthcoming at a later date. Especially where young adults are concerned, experience does not support the statement frequently made that the "T.B. minus" case, failing sanatorium treatment, will later develop into a "T.B. plus" case.

(4) X rays are invaluable in the differential diagnosis of chest diseases, but a poor skiagram is worse than useless. Unless, therefore, a first-class apparatus and a skilled interpreter are available, the general practitioner will be compelled to rely on the symptoms, physical signs, and bacteriological tests. A history of exposure to infection obviously indicates the need for special care, but whenever possible a radiographic examination of the chest should be made, for, as Dr. Brown rightly insists, it is only in the absence of each of the five criteria that pulmonary tuberculosis can be excluded with confidence.

THE STYPTIC EFFECT OF TRANSFUSED BLOOD.

It is generally agreed that blood transfusion is the most effective means of combating bleeding which occurs as a manifestation of the "hæmorrhagic diathesis." That this transfusion should have a beneficial effect by replacing lost blood is obvious, but it is far from clear why it should also stop the hæmorrhage, either for a time or permanently. The assumption has been that its hæmostatic effect is due to the introduction of thrombocytes or platelets into the circulation of the bleeder, but in considering this it has to be remembered that although most patients with manifestations of the hæmorrhagic diathesis show a thrombopenia, they do not all do so. Many a case has been reported in which bleeding ceased without any increase in the number of the platelets, and there are even records of hæmorrhage persisting despite the presence of platelets in fair numbers in the circulating blood. Evidence against the supposed hæmostatic activity of the transfused platelets is brought forward by Dr. Heinrich Engel,[1] of Prague, as a result of observations made in the course of treating four thrombopenic patients by blood transfusion. He found each time that within a few hours of transfusion the platelet count of the recipients had fallen to its original low level. In one case observations were made during and for 24 hours after the transfusion. In the course of the transfusion the blood was found to contain 28,110 platelets per c.mm.; within one hour they had fallen to 10,460; within six hours to 375, and 24 hours later to 80. Engel concludes that the beneficial results of blood transfusion in the hæmorrhagic diathesis are due primarily to the replacement of blood, which gives the patient a chance to tide over the thrombocytopenic period; he further believes that the transfused blood exercises a styptic effect which, although not due to the intact platelets it contains, may be partly traceable to their disintegration products. A part of the styptic effect, he suggests, may be in the nature of a protein shock reaction, due to the parenteral administration of a foreign protein, and in view of the well-known fact that the coagulability of the blood is increased after the induction of anaphylactic or anaphylactoid states this suggestion appears reasonable. It is supported by the common observation that those transfusions followed by pyrexia and even a definite rigor are particularly effective in stopping hæmorrhage. Since such reactions occur most frequently after transfusion by the citrate method, this may perhaps be regarded as recommending the method when arrest of hæmorrhage is desired.

GALL-BLADDER DISEASE IN THE YOUNG.

Dr. A. H. Potter[2] maintains that contrary to the generally accepted opinion, infections of the gall-bladder occur most commonly in adults under middle age, and that they may be met with quite often in adolescents and young children. In support of his contention he states that statistics of about 25,000 cases of gall-bladder disease collected from the reports of well-known clinics and hospitals show that the average age of patients at the time of operation is 36 years for females and 39 years for males, the interval between the onset of symptoms and the time of operation varying from 3 hours to 39 years. As regards the incidence of gall-bladder disease in very young persons Dr. Potter has collected and tabulated 226 cases in children not above 15 years of age, beginning with Gibson's case, reported in 1722, and ending with August, 1927. Negroes appear to be far less frequently affected than members of the white race. It is noteworthy that while in many instances the symptoms in children were as typical as in adults, children are rather inclined to complain of abdominal pain when gall-bladder disease is present. Dr. Potter contends that the acute infectious diseases of childhood have not received the attention they deserve as factors in the evolution of gall-bladder affections. Whereas in the past typhoid fever was generally the preceding factor in gall-bladder disease, of late years there has been a great decline in the incidence of typhoid, and if this continues the disease will be practically eliminated. On the other hand, there has been a great increase in influenza which Dr. Potter thinks is taking the place of typhoid as a factor in gall-bladder disease. Acute infections of the gall-bladder and cystic duct are usually accompanied by hydrops, which may be transitory or permanent. As the inflammation subsides the cystic duct recovers its function, drainage of the gall-bladder takes place, and hydrops disappears. Four cases in Dr. Potter's own practice occurred in a boy, aged 11, who had had influenza the previous year; a boy, aged 6, who had had scarlet fever 18 months before; a girl, aged 15, who had had influenza in the previous year; and a girl, aged 4½, without any history of illness. This incidence of infectious disease seems hardly greater than might be expected in a random sample of the child population. All the cases made a good recovery without operation.

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[1] Med. Klin., 1928, xxvi., 888.

[2] Surg., Gynec., and Obstet., June, 1928, p. 795.

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[1] Ministry of Agriculture and Fisheries. Third Progress Report of the Foot-and-Mouth Disease Research Committee. H.M. Stationery Office. 1928. 5s. Pp. 141.

It has not, however, been possible yet to test the method on cattle in this country. Vallée, however, has reported encouraging prophylactic results in bovines with a formalised vaccine. The differences existing between the three types of virus found in Germany by Waldmann and Trautwein have been confirmed, but, with one exception, the type found in Great Britain has always belonged to the same type as Vallée's O strain. Three methods have been successfully used for determining the type of a virus :—

1. Inoculation of animals recovered from an attack due to virus of a known type.
2. Inoculation of animals protected by a formalised vaccine made with a known type.
3. Inoculation of animals passively immunised with serum of a known type.

Prof. Ciuca, using materials from guinea-pigs, has found complement fixation an effective method of demonstrating the presence of antibodies in the serum of recovered animals and of determining the type of virus present. Further experiments with rats and rabbits have confirmed previous observations showing the slight susceptibility of these animals, and have given no support to the suggestion that the disease is spread by rodents. Mr. Galloway and Dr. Nicolau give an illustrated account of the minute structure of the secondary vesicles on the tongue of guinea-pigs following inoculation of the virus into the sole of the foot. The work was needed because former studies had almost entirely been concerned with lesions at the site of inoculation or with vesicles in a comparatively late stage of the natural disease. The earliest pathological changes detected were small groups of three or four epithelial cells situated at varying depths between the stratum granulosum and the basal layer. The cytoplasm of these cells showed an altered staining reaction, and the nuclear chromatin was condensed into one or more deeply staining masses. At the same time, or very soon after, two or three polymorph leucocytes appeared close to the altered epithelium, but no cellular reaction in the corium could be detected at this early stage. The histological evidence thus brought forward favours the view held by Galloway and Nicolau that the multiplication of the virus is primarily in the epithelial cells. Mrs. Maitland has found that after inoculation of the sole of one hind foot the usual secondary vesicles could be prevented from appearing on the other foot by protecting the latter from pressure with a splint or a cotton-wool pad. On the other hand, if parts of the feet and toes not usually affected were subjected to increased pressure, vesicles appeared on these unwonted sites. Not only was the formation of vesicles controlled in this way, but experimental examination of the skin of the feet showed that the virus had not multiplied in the usual way at the sites of predilection on the soles when vesicles did not occur. The fact that the coöperation of the virus and pressure was needed to produce both the ordinary lesions of the generalised disease and free propagation of the virus in the usual sites is an interesting example of mutual action and reaction of an infective agent and the tissues.

The report shows steady progress in our knowledge of the infective agent, the pathology, and the nature and control of immunity in this important disease.

PROTECTION OF MOTHERHOOD IN SWITZERLAND.

EIGHTEEN years ago Dr. Bernheim Karrer stated in writing that there was nothing which could fairly be described as systematic protection of motherhood and infancy in Switzerland. A good deal of progress has been made in the meantime, and in a recent issue of the monthly bulletin of the International Office of Public Health Dr. Karrer, who is now director of the cantonal day nursery at Zürich, gives a critical survey of the work undertaken for the preservation of maternal and infant life. He still finds his country behindhand in the matter of antenatal supervision, stating that German-speaking Switzerland possesses no such thing as an antenatal clinic except for one or two connected with maternity hospitals. In French-speaking Switzerland antenatal clinics are distinct institutions, but there are very few of them compared with the number of child welfare consultations. Again, while laws are in force which make careful provision for the nursing mother, both in money grants and exemption from heavy work, the pregnant woman may ask to be excused from work in a factory for eight weeks before confinement only at her own expense, there being no financial help to enable her to do so. This poverty of antenatal care is the more unfortunate, since little improvement has been effected in the toll of stillbirths and deaths in the first four days of life during the last 15 years. Whereas the general infantile mortality stands at 56·5, comparing favourably with many other European countries, the mortality of the first four days is 19·2. In other respects, however, strides have been made; pædiatrics is now an obligatory subject in the medical course and examinations, and the study includes hygiene and feeding of infancy. Midwives, who are still the chief counsellors of Swiss mothers, have also had their training stiffened up and lengthened, and health visitors and baby nurses take a year's course followed by examination. Instruction of the public, and especially of mothers, is forwarded by schools for mothers, infant consultations (always conducted by doctors), and travelling exhibitions. The institutions for the care of babies include maternity hospitals, children's hospitals with wards for infants, refuges for mother and child together, baby shelters, day nurseries, and residential nurseries. The nursery at Zürich, of which Dr. Karrer has charge, is a home with 45 beds, attached to the obstetric clinic; it is primarily intended for premature infants, but also admits sick newly-born infants referred from the clinic. Many children are put out to nurse and, though nominally under medical supervision, in some districts the supervision is by no means satisfactory. In Zürich the work is carried out from a child protection office, and is so well done that Dr. Karrer suffers less anxiety on behalf of illegitimate infants who leave the nursery than of those whose parents are poor and improvident. A number of similar voluntary societies, as well as the national organisation "Pro Juventute," do useful work in backing up the State provisions.

ATMOSPHERIC POLLUTION.

THE thirteenth report of the Advisory Committee on Atmospheric Pollution[1] covers observations made in the year ended March 31st, 1927. It is the last of these reports to be issued from the Meteorological Office (Air Ministry), for the work has been transferred to the Department of Scientific and Industrial Research which will from now on coördinate local records and prepare an annual report thereon. This task will remain in the hands of Dr. J. S. Owens, who can be addressed at 47, Victoria-street, London, S.W. 1. In addition to this routine survey special researches are to be directed towards the solution of the scientific problems of atmospheric pollution, and these will come under the Director of Fuel Research, supervised by a committee of the Department, of which Dr. G. C. Simpson, F.R.S., is chairman, and Mr. J. K. Best (Cadbury Bros.), Mr. J. H. Coste (Chief Chemist, L.C.C.), Dr. G. M. B. Dobson, F.R.S. (Lecturer in Meteorology, Oxford University), Dr. R. Whytlaw-Gray (Professor of Chemistry, Leeds University), and Sir Napier Shaw are members. The last named has also expressed his willingness to serve as the first chairman of a standing conference of coöperating bodies which will continue the consultative work of the Advisory Committee. The report, as heretofore, contains a mass of information on the deposit of impurity at 80 different stations in the United Kingdom. Although the good stations continue to show improvement the bad ones remain as bad as ever. The highest deposit of tar as well as of sulphates was at Burnley; the lowest in either category at Southport (Hesketh Park). Newcastle-on-Tyne scored highest for carbonaceous or sooty matter which there may make up 40 per cent. or more of the total deposit, the lowest record being at Rothamsted. Some of the reduction in the deposit of sulphates seems to be due to the increasing use of gas as a fuel. In London and Glasgow from 1914 to 1927 the sulphate deposit has diminished out of proportion to the total. An interesting curve shows the effect of suspended smoky matter in the coal stoppage of 1926 at Stoke-on-Trent; in London the event produced no appreciable effect. It is also clearly brought out in a curve that nearly the whole of the ultra-violet rays of sunlight are cut off by a comparatively small amount of smoke in the air. An interesting account is given of a haze in Norfolk which was found to consist of salt crystals. While the continuance of these detailed observations under the ægis of the Research Department is assured, it must be no small satisfaction to those who have taken a share in this laborious survey for so many years that there will now be fitting opportunity for organised research into the scientific problems involved. The time is ripe for drawing conclusions from an immense wealth of material.

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[1] Department of Scientific and Industrial Research. The Investigation of Atmospheric Pollution. Thirteenth Report. H.M. Stationery Office. 1928. Pp. 51. 6s. 6d.

SYNTHALIN IN DIABETES.

THE use of insulin in diabetes has certain disadvantages. Although the necessity for injection encourages exact dosage, so far as quantity is concerned, it does not reproduce the conditions of physiological secretion, and where large doses are given the immediate result of its administration may be an excessive reduction of the blood-sugar, followed later by hyperglycæmia when absorption of carbohydrate from the intestine is well under weigh. From almost every point of view it would be preferable to use a drug which could be given by mouth and absorbed slowly with other contents of the alimentary canal, and high hopes were raised a couple of years ago when it was suggested that insulin might find a supplanter in the new German preparation called synthalin. This drug had not been invented ad hoc, but had been evolved during a series of investigations on parathyroid tetany in which it was found that guanidine caused a fall in blood-sugar. This happened only at the cost of poisoning the animal, but aminobutyleneguanidine proved less toxic, and synthalin—so far the most satisfactory of this series of substitution products—was recommended as relatively innocuous.

Synthalin contains two molecules of guanidine, joined by ten CH_2 groups, and its action is shown to be wholly different from that of insulin, as it lacks the essential power of promoting the oxidation of glucose. The first accounts of its effect on patients were nevertheless distinctly favourable. Frank, Nothmann, and Wagner[1] reported that sugar disappeared from the urine in mild cases of diabetes and that the blood-sugar was lowered, though not reduced to normal; in severe cases the dose of insulin could be reduced. They admitted that synthalin did not act quickly enough to benefit patients in coma, and they did not approve its use for children. The Medical Research Council arranged for tests in this country, and preliminary reports from many British hospitals were published in THE LANCET about a year ago.[2] These included investigations carried out at St. Bartholomew's by Dr. George Graham and Dr. G. C. Linden, who have now published a more detailed account of their work.[3] In 8 patients out of 12 they found that synthalin caused a very definite and apparently beneficial change in the carbohydrate metabolism. In one of the eight 50 mg. of the compound replaced 10–15 units of insulin without the blood-sugar exceeding the normal limit, but in the remaining four it afforded no practical benefit. These results are not so good as those of the early workers, but they are better than some of the others reported. The mode of action, as Graham and Linden point out, is still obscure. Insulin is a natural secretion, and will always lower the blood-sugar if enough is given; synthalin is a foreign chemical and has no action on sugar in vitro. They consider that synthalin must influence the carbohydrate metabolism by modifying cellular activity, and that this action is possibly a minor part of the more general effect that shows itself in toxic symptoms. It may work by depressing the power of the liver (increased in diabetes) to deaminise amino-acids, or its action may be regarded as a slight degree of a poisoning which when severe causes nausea, vomiting, pain, and jaundice. It is, of course, possible that its effect on carbohydrate metabolism is distinct from its toxic action, and that its failures are due to some idiosyncrasy in the patient. If this is so, it offers a parallel to salvarsan, which does not itself kill spirochætes, but causes the body to generate a lethal substance, and which also fails in some patients, whilst on occasion it produces effects comparable with those of synthalin. The toxic properties of synthalin are, however, a very severe drawback to its employment, for few patients who have experienced them will ever run the risk again. They occurred in 5 out of the 12 cases treated in this test. As prophylaxis against them, Frank has recommended that the dose of synthalin be withheld every fourth day, and A. Adler uses with each dose grs. 3 of sodium dehydrocholate ("decholin") which increases biliary secretion and may perhaps accelerate the excretion of synthalin from the liver.[4] This preparation was not tested at St. Bartholomew's Hospital, but Graham and Linden suggest that it should always be used, and that the dose should be carefully limited by starting with small amounts and gradually increasing them.

The fate of the sugar which disappears is unknown. It is not found in the liver or muscles as glycogen, and the lactic acid which is formed quickly vanishes again. Synthalin may merely destroy the sugar in the blood as yeast does in the stomach, but the appearance in one patient of a severe ketosis three days after the suspension of treatment suggests that the disappearing sugar was at least exerting an anti-ketogenic influence. To sum up, Graham and Linden say that there is no good evidence that the patients are really the better for having synthalin. Patients who need insulin had better use the natural product if possible; the new synthetic rival has a place only when there is a reason against injection.

HARVEST BUGS.

WE have in this country so few animals which bite and prick and sting with serious results that we make a good deal of fuss about beasts which are hardly worse than interesting. And now that the season of sitting about in the open air is with us, many people who respond vigorously to its attentions will lament the existence of the harvest bug or mite. They should also read the account of the animal and its allies which is given by Mr. Cecil Warburton in *Parasitology* (July, 1928, p. 228). There are about a dozen species of mites which afflict man in much the same way in different parts of the world; in all cases it is the larva alone which is parasitic and, as the adults are hardly known, the systematics of the subject are considerably muddled. The only one of which the life-history may fairly be said to be known is the Japanese *Trombicula akamushi*, which is something more than an annoyance because it transmits the river fever or tsutsugamushi disease. The larva in this instance is found abundantly on field mice and readily attacks dogs, cats, guinea-pigs, and other animals besides man. After much labour Miyajima succeeded in rearing adults and found that they were neither parasitic nor predaceous but can be reared on such food as potatoes and melons and appear in nature to live on various plants; moisture is essential. Our national harvest bug is also a larva; none of the few people who have tried has succeeded in rearing the adult form, so that we have no means of knowing where and how it lives. More extraordinary still, perhaps, is the fact that those who study wild mites have failed to find one which may reasonably be supposed to be the missing parent. Obviously there is room here for an interesting piece of work. Dry grassy places, chalk downs, and the like, seem to be the animal's favourite habitat; it evidently lives somewhere, possibly underground or in the nests of mice. Meanwhile the best treatment for those who are particularly susceptible seems to be a complete change of clothes and a bath.

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[1] Klin. Woch., 1926, v., ii., 2100.
[2] THE LANCET, 1927, ii., 517.
[3] Quart. Jour. Med., July, 1928, p. 509.
[4] Klin. Woch., 1927, vi., i., 493.

SCARLET FEVER ANTITOXIN.

WHEN this antitoxin was first introduced the important question was whether we had, or had not, found a useful agent in the treatment of scarlet fever. That question has been answered in the affirmative. Though no efficient serum appears to be yet available for combating the septic complications such as adenitis, otitis, or mastoiditis. there is now general agreement in many countries that for the treatment of uncomplicated attacks of scarlet fever caused by the toxin of the scarlet fever streptococcus, and for the protection of susceptible individuals who have been exposed to infection, antitoxin is potent and specific. Its use is now widespread. The main interest has therefore shifted to the question of dosage and standardisation. Of the methods of standardisation which have been tried, three need human subjects—viz., the Schultz-Charlton test, passive immunisation, and the Dick method of "skin neutralisation"; in two methods animals are used—viz., the Wadsworth-Kirkbride skin neutralisation in goats and the Parish-Okell rabbit test. If a test involving the use of animals has an error no greater than those needing human subjects, the animal test will presumably gain acceptance. The various methods are being compared in many laboratories but no critical comparison appears yet to have been published. Dr. R. Cruickshank elsewhere in this issue concludes in favour of the skin neutralisation method in human beings and the rabbit test, though his own careful observations on the duration of passive immunity show that this also is a good method of titration, for the effect of a dose of 2·5 c.cm. can be clearly differentiated from that produced by twice the dose, the patients in the latter group remaining negative to the Dick test for a longer period. This method would provide those in isolation hospitals with a means of testing the serum they use, for 5 c.cm. of a good serum will, as he[1] and D. McClean[2] have shown, keep the majority of patients negative to the Dick test for seven to ten days and will protect contacts from infection with scarlet fever. Parish and Okell[3] state that an average concentrated serum will in a dose of 0·25 to 1 c.cm. protect rabbits against the acute illness produced by the injection of culture of scarlet fever streptococcus. This method they use for measuring the strength of sera. Both Cruickshank and R. E. Dyer[4] discuss the difficulties of the skin neutralisation test. Not all Dick-positive subjects are suitable for the test, because of serum sensitiveness, and the readings are not easy. In U.S.A. an official unit based on this method has been fixed and a minimum content of antitoxin prescribed. No English official unit has yet been adopted. Meanwhile, the general experience in England that the sera available are efficient in the treatment of scarlet fever and for the passive protection of contacts is evidence that the methods of titration of these sera in use in the various serum institutes are serving their purpose and ensuring supplies of satisfactory sera.

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[1] Glasgow Med. Jour., January, 1928.
[2] THE LANCET, 1927, i., 483.
[3] Jour. Path. and Bact., 1927, xxx., 521.
[4] U.S. Public Health Reports, 1928, xliii., 1659.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT CARDIFF.

(Continued from p. 250.)

SECTION OF SURGERY.

UNDER the presidency of Prof. A. W. SHEEN and later of Mr. A. J. WALTON, a discussion on the

DIAGNOSIS AND TREATMENT OF SPINAL CORD TUMOURS

was opened by Mr. DONALD ARMOUR, who limited himself to tumours arising from the cord, the spinal nerve roots, and the meninges, and chondromata of the intervertebral disc. Clinically they caused a paraplegia by compression. More than three-fourths were extramedullary and the intradural were more frequent than the extradural by three to one. Of intradural tumours about two-thirds were dorsal or dorsolateral in position. The course of the disease was usually slow and chronic and divided into three stages: (1) of root symptoms, usually unilateral; (2) of Brown-Séquard paralysis; (3) of complete compression, paraplegia, or bilateral paralysis. The symptoms generally appeared in the following order: Peripheral pain, increase of reflex activity below the point of compression, paralysis, loss of sensibility, and loss of reflex activity with flaccid paralysis. The commonest early symptom was localised, recurring and persistent pain, referred to the course of the nerve involved and attributed to innumerable conditions in the body and limbs. Pain in the back might be the only complaint for a long time, especially with lumbosacral and cauda equina growths. Pressure on the sensory tracts of the cord might cause pain in remote parts of the body before any motor or sensory changes could be discovered. Paræsthesiæ of various kinds might occur, at the level of the tumour, from root irritation; above the level, from pressure of the held-up cerebro-spinal fluid, or from sympathetic involvement; or below, from irritation of sensory tracts. Objective sensory changes were usually absent in the early stages and later depended on the amount of compression or destruction of the tracts. In extramedullary tumours there was some dissociation of sensations below the level of the tumour, while all types of sensation were equally involved in intramedullary growths, in which also the maximum sensory disturbance was often at and below the segmental level. Tactile sensation was less affected than pain and temperature. In tumours of the conus and cauda equina the sensory disturbance was usually bilateral and asymmetrical. Subjective motor disturbance usually followed subjective sensory symptoms and was progressive. In high tumours the order of limb involvement was almost always: homolateral upper limb, homolateral lower limb, contralateral lower limb, contralateral upper limb. The irritative stage, with tremor, muscular tension, and spasms was generally over by the time the patient came for examination, or was masked by a degenerative paralysis of the corresponding muscles with a diminished tendon reflex. When the tumour began to exert further pressure on the cord direct and indirect spinal symptoms appeared and were of great diagnostic value. Very often a minimal stimulus produced the "mass reflex." Bladder loss usually preceded rectal loss by some time. The pathological effects of the actual pressure on the cord were extraordinarily limited, as was shown by the recovery after removal of a large tumour. Paraplegia in flexion followed paraplegia in extension which might, however, be a very short stage.

Localising Symptoms.

Nystagmus might appear in high cervical tumours and bulbar symptoms occurred occasionally. Intense pain up the back of the neck and head might cause a clinical picture suggestive of caries or spasmodic torticollis. Involvement of the phrenic roots might cause diaphragm paralysis.

In lower cervical tumours four root syndromes might appear—Erb-Duchenne type; a middle type with atrophy of the triceps; Aran-Duchenne type and Dejerine-Klumpke type.

Lower dorsal tumours might simulate abdominal disease and lumbar tumours might show multiple root signs with atrophic paralysis. Tumours of the cauda equina caused intense pain radiating over the sacrum, perineum, and back of legs, and trophic sores were common.

Atypical clinical forms were of four kinds. Those with purely medullary symptoms showed paraplegia without any signs of root involvement. Those with purely root symptoms were like ordinary neuralgias. When there were multiple tumours, two root syndromes were superimposed. The vertebral form was marked by intense and diffuse pain and was often diagnosed as Pott's disease.

There was no symptom which occurred exclusively with any one kind of tumour. The symptoms differed in sequence, duration, and time of onset according to the localisation of the growth. A short history was in favour of the more rapidly growing extradural variety. Bony changes were rarely seen in intradural tumours and were common in extradural. Other features of extradural tumours were sensitiveness to pressure over the spine and absence of root pain and xanthochromia; lumbar puncture might cause sudden and marked increase in symptoms. Great excess of protein in the lumbar fluid combined with completely normal cisternal fluid or a "reversed" Brown-Séquard syndrome was in favour of an extradural growth. As a rule, intramedullary tumours were characterised by less frequent root pains, less spastic paraplegia, and more common amyotrophic phenomena, a more marked alteration in painful and thermal sensibility and a typical and clearly shown dissociated anæsthesia. In favour of a diagnosis of extramedullary tumour was: a preliminary stage of root pain, slow but continuous development of alteration in motor and sensory function, a growth in breadth rather than in length, fairly long persistence of a Brown-Séquard syndrome, marked spasticity persisting after the appearance of complete paraplegia with Babinski's sign; symptoms of motor root irritation and absence of signs of atrophic degenerative paralysis, and of trophic troubles, and the "loculation syndrome" in the cerebrospinal fluid.

Combined cisternal and lumbar puncture was a diagnostic aid revealing below an area of compression, xanthochromia, increased protein and other substances, and occasionally spontaneous coagulation. The replacement of cerebro-spinal fluid by air caused no nausea, pain, or collapse in cases of spinal block. Lipiodol injection was not very reliable, and there might be sensory lipiodol dissociation; its greatest field of usefulness was where the sensory level was not well defined.

There was only one treatment—operation—which demanded correct diagnosis and precise level localisation. Segments of the cord did not correspond with the vertebræ of the same name, and there were also individual differences. The operation of choice was laminectomy as developed by Victor Horsley, with the patient in the lateral position, under intratracheal ether. (Mr. Armour then described the technique in detail.) French authorities were more enthusiastic than others in the use of X rays and radium for inoperable growths, but even they were cautious and warned against exaggerating the curative value.

Dr. G. **RIDDOCH** said that diagnosis must ultimately rest on the existence of a progressive paraplegia with signs pointing to root involvement. Remote signs might be absent at a stage when diagnosis was quite possible, or focal signs might be absent throughout. Clinical features came first in diagnostic significance, followed by investigation of the cerebro-spinal fluid and vertebral signs and, in selected cases, by other methods for determining the patency of the subarachnoid space. The paraplegia developed in a certain definite way; the first stage was a spastic paraplegia in extension, with a weakness that was more flexor than extensor, and which appeared more in the lower limbs, with downward pointing of the foot and toes. The reflexes were all increased and Babinski's sign was present. Homolateral extension of the whole limb might be evoked by stimulating the leg below the knee, and the gait was spastic. In the second and graver stage, of paraplegia in flexion, the flexion reflex dominated the reflex picture and could be obtained by stimulation of any part of the limb, and the mass reflex might be evoked. In the third stage there was flaccid paralysis. The diagnosis of the level of the growth was made primarily on focal signs, which might be of root or of segmental origin. The former pointed definitely to the segment involved, but the latter did not. Motor signs were usually of less value. Diagnosis was most difficult when there were no focal signs and reliance had to be placed on the often equivocal sensory phenomena and the motor and reflex signs, which were not much help. It was necessary to ascertain the point where normal sensibility changed into abnormal, and not merely the highest limit of complete anæsthesia; moreover, the obliquity of the fibres had to be taken into consideration. The appreciation of tuning-fork vibration was often valuable and might be impaired when the posterior columns were involved. On the whole, intramedullary tumours were more often cervical or lumbosacral in location and extramedullary ones about the regions of the enlargements. With the former, remote and focal signs appeared more or less together, while with extramedullary growths the focal signs might appear long before there was any paraplegia.

Lipiodol Injections.

Sir **PERCY SARGENT** showed lantern slides of different varieties of tumour and X rays of lipiodol injections. Lipiodol, he said, sometimes caused severe root pain and might have serious after-results. When successful it was very useful, but the better the neurologist the less often would it be necessary and it should be used less rather than more. Intramedullary tumours usually extended over many segments, producing an elongated block, in contrast with the local block of extramedullary growths. By a cisternal injection and a lumbar injection with the patient inverted, it was possible to map out an area of block. The prognosis of patients with intramedullary tumours was not hopeless—he had seen three recoveries. The operative mortality-rate was very low; the worst areas were between the second and fifth dorsal, where serious cardiac, gastric, or intestinal disturbance might be caused. The excellent recovery depended on the facts that compression had been very slow, that the bladder function was usually involved very late and very slightly, and that bedsores were very rare; there were therefore no septic complications.

Mr. **LAMBERT ROGERS** recorded six cases of spinal tumour from the Welsh National School of Medicine, one in a girl of 16, who had made a remarkable recovery. The tumour had contained many psammoma bodies and also masses of true bone, a very rare finding which afforded evidence of the essential similarity of cranial and spinal meningiomas and supported the mesoblastic derivation of membranes.

Mr. G. **JEFFERSON** said that his experience of spinal cord tumours was that they were practically painless and patients complained of spastic paraplegia. The syndrome of cord compression followed in a definite sequence, first a disturbance of motor power in the legs and then sensory changes of a particular kind, notably dissociation. He then showed a number of charts demonstrating the results of investigating the cerebro-spinal fluid by the Queckenstedt method.

The Importance of Early Diagnosis.

Mr. **WILFRED TROTTER** spoke for the common man, and said that the diagnosis was often missed in the early stages, especially when the disease began as unexplained pain, which was almost always diagnosed by some meaningless phrase, varying from year to year with the fashion—*neuritis, sciatica, arthritis*, fibrosis. That was the form in which spinal tumour came before the panel doctor. The commonest tumour was the neurofibroma, and this essentially began with root pain, without any physical signs. If it were then diagnosed, treatment would be early and almost invariably successful.

Mr. H. ADAMS quoted a case of psammoma of the sixth dorsal region, which began as a painless limp. He suggested that the neurofibroma type might be the cause of pain, while the psammoma and endothelial type of tumour was the cause of spastic paraplegia.

Mr. STANLEY FOSTER recorded several cases with no paraplegia, only pain; one had been diagnosed as neurasthenia, and another as Pott's disease and disseminated sclerosis successively.

Mr. R. BROCKMAN said that cases of unexplained pain were the most difficult to diagnose, and instanced one woman with unilateral pain radiating from the lumbar region round to the pelvis. She had had an inflammatory mass removed from her abdomen and a subsequent nephrectomy without relief, and died suddenly after a profuse hæmorrhage from a spinal tumour. Cases of "curious pain" should always suggest spinal cord tumour.

Mr. WALTON said that the slower the course the better the prognosis, as the ultimate results depended less on the presence of a tumour than on the damage it had done, which was proportional to the rapidity of its growth. All cases should be operated upon at once. He agreed with Mr. Armour's technique. What operative risks there were were the accidental risks of all operations.

TREATMENT OF GANGRENE.

Mr. SAMPSON HANDLEY (London), in opening the discussion, said he proposed to confine his remarks to more recent methods of vasomotor surgery in relation to gangrene, and gave a brief history of the subject. He described Leriche's method of performing periarterial sympathectomy and stated that this surgeon had had successes in various conditions, but he did not perform his operation for gangrene. According to Prof. Leriche, after sympathectomy there is a local contraction of the artery, and for some hours pulsation is feeble and the limb is colder than its fellow. This is followed by elevation of the temperature of the limb and of the arterial pressure, and by increased amplitude of the pulse for from three to four weeks.

The speaker then drew attention to his method of alcohol injection, which he believed was a definite advance on Leriche's operation, and claimed that in certain cases it will avert threatened gangrene, or arrest the spread of senile gangrene already present, and so obviate amputation. The technique used is to expose the femoral artery in Hunter's canal for 1 to 2 in. With the finest possible hypodermic needle 2 to 3 minims of alcohol are injected at four points spaced round the artery, the needle being inserted obliquely and nearly parallel to the vessel. When the injection is complete a whitish band about ½ in. wide should be seen round the artery, but no constriction takes place. The effect of alcohol injection is that the foot in successful cases becomes warmer almost at once and the vasodilatation may last for a year or more, whereas it is stated to pass off in a few weeks after Leriche's operation. Mr. Handley mentioned some criticisms of the method and stressed the difficulty of making a proper selection of cases at present. In regard to indications, he would advise it strongly in cases of threatened or incipient gangrene of a lower limb, but would prefer to employ it in the prodromal stage. He considered it useless in Buerger's disease and of doubtful value in Raynaud's disease. Finally, he claimed that alcohol injection was a distinct advance on Leriche's operation, and appealed to medical men when first consulted for symptoms of arterial dystrophy to allow vasomotor surgery a fair field in its attempts to avert the onset of gangrene and the loss of a limb.

Mr. PHILIP TURNER (London) said he would confine himself to the clinical aspects of periarterial sympathectomy, which he had performed eight times, twice by operation and six times by alcohol injection. Of these, three were very striking successes which he narrated, three were temporarily improved, and two, whose general condition was very bad, died. Mr. Turner pointed out that following sympathectomy the following clinical effects were seen whatever their cause—namely, increased warmth of the foot, relief of pain, disappearance of swelling, rapid formation of a line of demarcation, and improvement in general condition. Mr. Turner said this operation was a valuable addition to amputation, which might be avoided in 25 per cent. of cases and delayed in 50 per cent., and in his opinion it is particularly indicated in early cases of senile gangrene and should be carried out as soon as the diagnosis is made.

Mr. E. G. SLESINGER (London) could not agree that sympathectomy acted by dividing the vasoconstrictor fibres; all modern evidence, he said, was against this. He suggested that what were divided were the afferent sensory nerves of the arteries, and the effect of sympathectomy was due to breaking the reflex arc. He discussed arterial pain and compared the pain of *angina pectoris* and *abdominis* with that of incipient gangrene. In his experience the operation succeeded when there was reflex spasm in addition to organic narrowing. He could see no advantage in the method of alcohol injection over sympathectomy which he had performed 25 times with no mortality. Finally, he urged that sympathectomy should be tried in all painful cases of organic vascular disease, since it would relieve pain almost certainly and might, in addition, improve the circulation.

Mr. W. A. COCHRANE (Edinburgh) had treated cases of gangrene by exposing the main artery and rubbing it with gauze, and had had successes. He considered it of no value in endarteritis obliterans, but had found temporary benefit in varicose ulcers.

Sir WILLIAM WHEELER (Dublin) had no experience of alcohol injection. He related cases of thromboangiitis obliterans in which he had performed sympathectomy with no benefit and with no relief of pain, and he stressed the importance of removing the whole sheath.

Mr. R. StL. BROCKMAN (Sheffield) put in a strong plea for alcohol injection on the ground of simplicity which brought it within the compass of every surgeon. He considered it of value as a preliminary to amputation.

Mr. HANDLEY, in replying, mentioned the possible danger of absorption of toxic materials from the dead gangrenous part as the result of vasodilatation after operation.

FALLACIES OF X RAYS IN ABDOMINAL DIAGNOSIS.

At a discussion held jointly with the Section of Radiology, Mr. H. J. PATERSON (London) began by pointing out that medicine, being essentially an art, laboratory methods can never replace clinical observation. The chief fallacies as regards surgery might be grouped as: (1) those *incidental* to X rays; (2) those due to errors of technique; (3) those of misdirection; (4) those of interpretation. Under (1) the speaker said that X rays exaggerated stasis and a better method of estimating this was the charcoal method; a further fallacy under this head was spasm. Duodenal ulcers were seldom shown by X rays, but often inferred when not present, and whether gastric ulcers were shown depended on their size and depth. Under fallacies of technique were instanced the need for exposures in different positions, and the importance of having the stomach well filled with barium. *Fallacies* of misdirection consist of diverting the attention to some abnormality of less serious import than the main disease. The last group of fallacies of interpretation were *numerous* and cases were mentioned of error in connexion with gall-stones, ureteric calculi, appendicitis, gastric ulcer, adhesions, &c. Mr. Paterson said an insidious fallacy was the claim that healing of a gastric ulcer could be shown by X rays. Ulcers are stated to heal in a few weeks after alkali treatment, but is the evidence good enough considering the intermittent nature of the disorder? Finally, the opener said he did not question the utility but the infallibility of X ray diagnosis.

Dr. F. HERNAMAN-JOHNSON (London) stressed the advantage of X rays over charcoal in localising stasis of the bowel. In regard to spasm he would hold that spasm persisting after full doses of belladonna shows some lesion in the alimentary tract. Failure to find organic lesions does not prove their non-existence, and a negative X ray can only exclude gross deformity. He objected to including fallacies of misdirection, as it is important to demonstrate any definite lesion. Fallacies of interpretation must always remain and no radiologist could differentiate on X ray evidence only between an inflammatory lump and carcinoma. It is important for radiologists to indicate which of their deductions depend on X ray findings and which on examination and history. The speaker pointed out the importance of not calling an appendix normal because X ray examination does not incriminate it, and stated that a pelvic cæcum which does not rise on a barium enema and which contains residue after 24 hours often means appendicitis.

Dr. A. F. HURST (London) said the diagnosis of gastric and duodenal ulcer depended largely on the skill of the radiologist and in experienced hands should be right in 90 per cent. of cases. He would never diagnose gastric or duodenal ulcer without X ray evidence and the same applied to carcinoma. In his opinion, if there was no obstruction, all gastric ulcers would heal if treated medically, provided treatment was sufficiently long and thorough, and their healing could be shown by X rays. Dr. Hurst mentioned the fallacy by which a not uncommon diverticulum in the region of the cardia is mistaken for ulcer.

Mr. W. MCADAM ECCLES (London) stressed the importance of a complete radiological examination, and mentioned cases where incomplete examination had led to unnecessary removal of the appendix.

Prof. A. FULLERTON (Belfast), after pointing out the necessity of piecing together the evidence of various investigators in order to make a diagnosis, discussed the value of stereoscopic X rays in differentiating phleboliths and calcareous glands from urinary calculi.

Sir WILLIAM WHEELER appealed to radiologists to follow-up operations performed on cases they had seen, and said it was important not to give too definite a negative report lest further observation of the case might be discouraged. Personally, he thought there was no such thing as medical treatment for chronic gastric ulcer.

Mr. RENDLE SHORT (Bristol) spoke of the value of coöperation between radiologist and surgeon and of the difficulty of proving a negative. In his experience, if the clinical diagnosis and the X ray diagnosis differed, the X ray diagnosis was more often the correct one.

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The Chairman, Prof. A. W. SHEEN (Cardiff), spoke of the effectual cooperation that existed in his clinic, and said that negative X ray findings were often as important as positive ones.

Dr. O. LEWELLIN RHYS (Cardiff) likened the radiographer of some years ago to the race-course tipster who had to name the winner before the race, and was abused if he failed to do so. Nowadays, the surgeon must bear his share of responsibility for a preoperative diagnosis.

SECTION OF PATHOLOGY AND BACTERIOLOGY.

Sir THOMAS HOUSTON took the chair at a discussion on the

BACTERIAL FLORA OF THE INTESTINE IN HEALTH AND CHRONIC DISEASE

which was opened by Prof. J. CRUICKSHANK (Aberdeen), who surveyed the bacterial contents of the newly born and traced the changes that occur as age advances. He pointed out that the meconium is sterile, but *organisms appear in small numbers* in the first 24 hours after birth. During the first few days the organisms most frequently found are the *Staph. albus*, *Strept. fæcalis*, and members of the *B. coli* group. In the first sample of the meconium free fæces an organism of the *B. bifidus* type, appears. This latter organism increases in number and replaces other organisms to a large extent. If the child is breast fed, the *bifidus* type constitutes 95 per cent. of the organisms present. In artificially fed infants the predominant organisms are of coliform type. The fæces of breast-fed infants are distinctly acid in reaction, while those of artificially fed infants are alkaline or neutral. *B. bifidus* and organisms of the *acidophilus* type can survive exposure to highly acid fluids, which destroy coliform organisms. Thus the bacterial content of the intestine is related to the chemical reaction. Spore-bearing organisms are absent from the suckling's stool for the same reason. When breast-feeding is over opportunity is offered for the invasion of the alimentary canal by many organisms. The intestinal organisms have been grouped into two types, proteolytic and saccharolytic. Experimentally it has been found that a high carbohydrate diet gives a flora rich in *bifidus* and *acidophilus*, whereas a high protein diet gives a predominance of coliform organisms and spore bearers. Lactose appears to be the determining factor in the production of the saccharolytic type of flora. In 1915 Torrey reported favourably upon the use of lactose in typhoid fever, a most marked change occurring in the bacterial flora. The same treatment has been applied to conditions of intestinal origin in children associated with lassitude and anorexia with diarrhœa or constipation, in which there is proteolytic intestinal flora. A quicker transformation of the flora is achieved by combining lactose diets with cultures of *acidophilus* organisms. Prof. Cruickshank attributed the action of the sugar to its being attacked by *B. coli* and *B. welchii*, the various acid substances produced offering a suitable pabulum for the growth of *B. acidophilus*. This is suggested by the fact that direct inoculation of fæces into milk gives abundant growth of *B. coli* and enterococci in the first few days, but at a later date vigorous growth of *B. acidophilus* occurs. Sugars other than lactose have been tried but the above results have not been obtained. Starchy foods, however, tend to change the flora. The administration of animal proteins, on the other hand, produces a marked proteolytic or putrefactive flora. The speaker emphasised that to change the type of bacteria to the acid variety large quantities of lactose must be used, together with an *acidophilus* culture capable of surviving in the intestine. He further declared that the types of intestinal flora are most probably the result of abnormal intestinal conditions and not the cause of them. Dealing with the subject of auto-intoxication, he said that nothing had emerged from chemical or bacterial research in recent years to support the view that harmful substances are elaborated by bacteria in the intestine and then absorbed. It had been shown that a closed-off loop of intestine may contain very toxic material, but this is incapable of deleterious effects until the intestinal mucosa is grossly damaged. Experimentally produced intestinal obstruction in dogs tended to show that the resulting toxæmia is not so much due to bacterial disintegration above the obstruction as to mechanical disturbances below. In chronic ulceration there is frequently no evidence of intestinal toxæmia in many cases, although it might unexplained pain, which was almost always diagnosed by some meaningless phrase, varying from year to year with the fashion—neuritis, sciatica, arthritis, fibrosis. That was the form in which spinal tumour came before the panel doctor. The commonest tumour was the neurofibroma, and this essentially began with root pain, without any physical signs. If it were then diagnosed, treatment would be early and almost invariably successful.

Mr. H. ADAMS quoted a case of psammoma of the sixth dorsal region, which began as a painless limp. He suggested that the neurofibroma type might be the cause of pain, while the psammoma and endothelial type of tumour was the cause of spastic paraplegia.

Mr. STANLEY FOSTER recorded several cases with no paraplegia, only pain; one had been diagnosed as neurasthenia, and another as Pott's disease and disseminated sclerosis successively.

Mr. R. BROCKMAN said that cases of unexplained pain were the most difficult to diagnose, and instanced one woman with unilateral pain radiating from the lumbar region round to the pelvis. She had had an inflammatory mass removed from her abdomen and a subsequent nephrectomy without relief, and died suddenly after a profuse hæmorrhage from a spinal tumour. Cases of "curious pain" should always suggest spinal cord tumour.

Mr. WALTON said that the slower the course the better the prognosis, as the ultimate results depended less on the presence of a tumour than on the damage it had done, which was proportional to the rapidity of its growth. All cases should be operated upon at once. He agreed with Mr. Armour's technique. What operative risks there were were the accidental risks of all operations.

TREATMENT OF GANGRENE.

Mr. SAMPSON HANDLEY (London), in opening the discussion, said he proposed to confine his remarks to more recent methods of vasomotor surgery in relation to gangrene, and gave a brief history of the subject. He described Leriche's method of performing periarterial sympathectomy and stated that this surgeon had had successes in various conditions, but he did not perform his operation for gangrene. According to Prof. Leriche, after sympathectomy there is a local contraction of the artery, and for some hours pulsation is feeble and the limb is colder than its fellow. This is followed by elevation of the temperature of the limb and of the arterial pressure, and by increased amplitude of the pulse for from three to four weeks.

The speaker then drew attention to his method of alcohol injection, which he believed was a definite advance on Leriche's operation, and claimed that in certain cases it will avert threatened gangrene, or arrest the spread of senile gangrene already present, and so obviate amputation. The technique used is to expose the femoral artery in Hunter's canal for 1 to 2 in. With the finest possible hypodermic needle 2 to 3 minims of alcohol are injected at four points spaced round the artery, the needle being inserted obliquely and nearly parallel to the vessel. When the injection is complete a whitish band about ½ in. wide should be seen round the artery, but no constriction takes place. The effect of alcohol injection is that the foot in successful cases becomes warmer almost at once and the vasodilatation may last for a year or more, whereas it is stated to pass off in a few weeks after Leriche's operation. Mr. Handley mentioned some criticisms of the method and stressed the difficulty of making a proper selection of cases at present. In regard to indications, he would advise it strongly in cases of threatened or incipient gangrene of a lower limb, but would prefer to employ it in the prodromal stage. He considered it useless in Buerger's disease and of doubtful value in Raynaud's disease. Finally, he claimed that alcohol injection was a distinct advance on Leriche's operation, and appealed to medical men when first consulted for symptoms of arterial dystrophy to allow vasomotor surgery a fair field in its attempts to avert the onset of gangrene and the loss of a limb.

Mr. PHILIP TURNER (London) said he would confine himself to the clinical aspects of periarterial sympathectomy, which he had performed eight times, twice by operation and six times by alcohol injection. Of these, three were very striking successes which he narrated, three were temporarily improved, and two, whose general condition was very bad, died. Mr. Turner pointed out that following sympathectomy the following clinical effects were seen whatever their cause—namely, increased warmth of the foot, relief of pain, disappearance of swelling, rapid formation of a line of demarcation, and improvement in general condition. Mr. Turner said this operation was a valuable addition to amputation, which might be avoided in 25 per cent. of cases and delayed in 50 per cent., and in his opinion it is particularly indicated in early cases of senile gangrene and should be carried out as soon as the diagnosis is made.

Mr. E. G. SLESINGER (London) could not agree that sympathectomy acted by dividing the vasoconstrictor fibres; all modern evidence, he said, was against this. He suggested that what were divided were the afferent sensory nerves of the arteries, and the effect of sympathectomy was due to breaking the reflex arc. He discussed arterial pain and compared the pain of angina pectoris and abdominis with that of incipient gangrene. In his experience the operation succeeded when there was reflex spasm in addition to organic narrowing. He could see no advantage in the method of alcohol injection over sympathectomy which he had performed 25 times with no mortality. Finally, he urged that sympathectomy should be tried in all painful cases of organic vascular disease, since it would relieve pain almost certainly and might, in addition, improve the circulation.

Mr. W. A. COCHRANE (Edinburgh) had treated cases of gangrene by exposing the main artery and rubbing it with gauze, and had had successes. He considered it of no value in endarteritis obliterans, but had found temporary benefit in varicose ulcers.

Sir WILLIAM WHEELER (Dublin) had no experience of alcohol injection. He related cases of thrombo-angiitis obliterans in which he had performed sympathectomy with no benefit and with no relief of pain, and he stressed the importance of removing the whole sheath.

Mr. R. StL. BROCKMAN (Sheffield) put in a strong plea for alcohol injection on the ground of simplicity which brought it within the compass of every surgeon. He considered it of value as a preliminary to amputation.

Mr. HANDLEY, in replying, mentioned the possible danger of absorption of toxic materials from the dead gangrenous part as the result of vasodilatation after operation.

FALLACIES OF X RAYS IN ABDOMINAL DIAGNOSIS.

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In 1915 Torrey reported favourably upon the use of lactose in typhoid fever, a most marked change occurring in the bacterial flora. The same treatment has been applied to conditions of intestinal origin in children associated with lassitude and anorexia with diarrhœa or constipation, in which there is proteolytic intestinal flora. A quicker transformation of the flora is achieved by combining lactose diets with cultures of *acidophilus* organisms. Prof. Cruickshank attributed the action of the sugar to its being attacked by *B. coli* and *B. welchii*, the various acid substances produced offering a suitable pabulum for the growth of *B. acidophilus*. This is suggested by the fact that direct inoculation of fæces into milk gives abundant growth of *B. coli* and enterococci in the first few days, but at a later date vigorous growth of *B. acidophilus* occurs. Sugars other than lactose have been tried but the above results have not been obtained. Starchy foods, however, tend to change the flora. The administration of animal proteins, on the other hand, produces a marked proteolytic or putrefactive flora. The speaker emphasised that to change the type of bacteria to the acid variety large quantities of lactose must be used, together with an *acidophilus* culture capable of surviving in the intestine. He further declared that the types of intestinal flora are most probably the result of abnormal intestinal conditions and not the cause of them. Dealing with the subject of auto-intoxication, he said that nothing had emerged from chemical or bacterial research in recent years to support the view that harmful substances are elaborated by bacteria in the intestine and then absorbed. It had been shown that a closed-off loop of intestine may contain very toxic material, but this is incapable of deleterious effects until the intestinal mucosa is grossly damaged. Experimentally produced intestinal obstruction in dogs tended to show that the resulting toxæmia is not so much due to bacterial disintegration above the obstruction as to mechanical disturbances below. In chronic ulceration there is frequently no evidence of intestinal toxæmia in many cases, although it might be expected that absorption of toxic substances would take place at the site of damage of the mucosa. Many workers have held that intestinal mucus is an important defence against the invasion of organisms. Absence of vitamin A from the diet has been shown to produce changes in the mucous glands, and it is believed that these changes permit the entry of organisms normally held at bay. These views have been confirmed by further work in which animals have been fed on a diet deficient in vitamin A and subsequently found to be much less resistant to pathogenic organisms administered by the alimentary canal than other animals on a normal diet. It has been also shown that there is a relationship between the reaction of the intestinal contents and the occurrence of rickets, in this latter pathological condition the cæcal contents being alkaline while administration of cod-liver oil results in a change to an acid reaction. Deficiency in vitamin B is also associated with alkalinity of the cæcal contents. In considering the possible relationship of pernicious anæmia and intestinal toxæmia, it was pointed out that such relationship had not been proved. *B. welchii*, one of the organisms held responsible for the condition, is present in normal stools and no increase in pathogenicity or hæmolytic power has been found in pernicious anæmia. Further, bacterial toxins similar to that of *welchii* may be administered by the mouth without producing specific symptoms. Prof. Cruickshank strongly emphasised the importance of realising that an enormous variety of organisms can be cultured from normal fæces by various bacteriological methods, and he deplored the too often labelling of organisms as pathogenic with immediate recourse to the use of vaccines. Many of the organisms occurring in the intestine are ingested in the food and dust and are passively carried by the intestinal contents. Others find conditions suitable for multiplication. Before accepting an organism found in the stool as the causative agent even in acute intestinal disorders, much evidence other than its presence in considerable numbers, or that it shows pathogenic properties on injection into animals, must be presented. The organisms in the human intestine were compared with those occurring in the soil, the flora in each case being determined by the nature of the available food material. If the intestinal contents could be more frequently regarded as material which is outside of the tissues, and separated from these by a mucous membrane which is endowed with peculiarly selective absorptive powers, there would be less tendency to regard the bacterial flora of the intestine or its individual members as concerned in the causation of many chronic conditions in the human subject.

Discussion.

Sir THOMAS HORDER supported Prof. Cruickshank's contentions and said he was glad to receive academic support to his own beliefs on the subject. The standards at present used as criteria of pathogenicity of intestinal organisms are unsatisfactory. Further, there is no standard technique, with the result that clinicians are at a loss to understand the varying bacteriological reports on the same sample of material submitted to a variety of workers.

Prof. J. H. DIBLE (Cardiff) described a large series of investigations of intestinal organisms during the period of the war. In the first group of this series Morgan's No. 1 bacillus was extremely rare. There were no cases of dysentery in this group. In successive groups dysentery became a frequent occurrence and Morgan's No. 1 became proportionately more frequent. The criteria on which the diagnosis of hæmolytic streptococci is based was also carefully considered. Some methods show a large percentage of these organisms in the fæces in certain cases, but a more detailed and extended investigation throws doubt on the findings recorded. Prof. Dible also pointed out the extreme difficulty of determining the exact nature of a normal intestinal flora.

Dr. A. F. S. SLADDEN (Swansea) spoke from the point of view of a routine bacteriologist. He emphasised the need for clarity on this subject. Regarding technique, he believed that material from the mucosa rather than mixed fæces should be used in bacteriological investigations. Direct examination of stools for micro-organisms he considered of doubtful use. A new method of investigation is required, and such a method must be short to be of value to the clinical bacteriologist.

Dr. L. P. GARROD (London) had carried out a series of careful investigations in an attempt to establish what fraction of the intestinal bacteria in health and disease is composed of streptococci. He was able to show that a low carbohydrate diet was associated with a diminished number of streptococci. He was unable to show that the bile in the intestine had any effect on these organisms, neither did the chemical reaction influence the relative numbers. In cases of pernicious anæmia, colitis, and chronic arthritis no definite increase of streptococci could be found. Dr. Garrod believed that estimation of the numbers of streptococci as an indication of pathogenicity is misleading.

Dr. A. P. CAWADIAS (London) dealt with the clinical aspect. He classified intestinal infection into extra-infection and auto-infection. The auto-infections may be of saccharolytic or proteolytic type. He had obtained good results by the use of vaccines. He said further that cases of auto-intoxication occurred with no symptoms of intestinal disturbance. He considered the possibility of mild anaphylaxis being the cause of these latter conditions should be given every consideration.

The CHAIRMAN expressed the opinion that the percentage of streptococci found in the stools depends on the cultural method used. The discussion had shown that no useful conclusions could be drawn from a bacteriological examination of the stools with present technique. It would be, however, difficult to convince clinicians on this point. An important point in favour of absorption of organisms from the intestine is the presence of intestinal organisms in remote parts of the body. The speaker had investigated several cases in which the enterococcus was believed to be the organism causative of lesions in urinary tract and nose. An organism had been isolated from stools in cases of ulcerative colitis by Burger and by Houston. This organism, believed to be the cause of the associated lesion, is said by the speaker to be of enterococcus type. He had also obtained good results from vaccines in cases of believed intestinal auto-intoxication of enterococcus type.

Reply.

Prof. CRUICKSHANK, in reply, said it is necessary to show that organisms or their toxins are absorbed before good results said to be obtained by vaccines can be claimed to be due to antibodies. If chemical substances are absorbed the formation of antibodies to combat them is unlikely. He expressed doubt on the benefits claimed from vaccine treatment. The possibility of anaphylaxis as a resultant of disturbed intestinal conditions was worthy of consideration.

SECTION OF ORTHOPÆDICS.

UNDER the presidency of Sir JOHN LYNN-THOMAS a discussion on

LOW BACKACHE AND SCIATICA

was opened by Mr. W. A. COCHRANE, who said that careful eliminative diagnosis left a large group which was essentially orthopædic, and which included the industrial lame backs. A painstaking and meticulous routine examination was of the utmost importance. Special attention must be paid to the anatomical type of the individual. The slender, tall and lanky, or small and delicate patient was unfit for heavy work and subject to functional breakdown of the back. The second point for consideration was the impairment of the normal balancing mechanism by bad posture. The lumbo-sacral joints in particular were overloaded in heavy people with prominent sagging abdomens, and the sacro-iliac joint was also exposed to static insult from flat-foot, short leg, or a hip affection. When X rays revealed no intrinsic lesion of the lumbo-sacro-iliac region the need for accurate diagnosis was acute. A negative X ray photograph did not warrant the assumption that there was nothing the matter with the patient, and careful reading of good stereoscopic radiograms often revealed a departure from normal in extrinsic lesions. In cases of alleged injury the symptoms were usually out of all proportion to the severity of the trauma. Compression fractures of the spine sometimes followed comparatively minor injuries, and were often overlooked. A lateral view often revealed a lesion that had been overlooked in the antero-posterior view. A complex and difficult problem was that of the relationship of anatomical variations of the fifth lumbar vertebra to backache and sciatica; was the association causal or casual? As Osgood said, the abnormality was to be regarded as potentially contributory, and there was an undoubted connexion between the presence of abnormality and the occurrence and persistence of symptoms.

The most difficult problem in cases of injury was the mental one. Malingerers, however, were not common. The workman was often genuinely deceived as to the true sequence of events, and, having little to show for his symptoms, was apt to exaggerate.

Differential diagnosis was always difficult, and definite intrinsic pathological lesions of bone and joint must first be eliminated. The chief points to be noted were the general build and attitude of the patient; the presence or absence of the normal lumbar curve, of listing or lateral deviation of the spine, of restricted and painful movements, of spasm or wasting of muscles, of swelling and points of tenderness, and the nerve function in the legs.

Clinical Classification.

Acute traumatic strain was a rupture of ligamentous and muscular fibres with all the phenomena of acute injury. A lesion in muscle caused pain when the muscle was thrown into action; a lesion of fibrous tissue when it was put upon the stretch; a lesion of bone or joint on all movements of the spine. The treatment was rest. A superadded infective focus might keep up the disability, as would also poor bodily mechanics and posture. While complete rest was advisable for a torn muscle or aponeurosis, a sprained joint should be made active as soon as possible.

General postural strain was a condition of general muscular fatigue and ligamentous strain. The patient complained of dull aching in the shoulders and low back, relieved by rest. There was usually poor posture and fatiguing occupation. Treatment was by rest, support, and postural re-education.

Lumbo-sacral strain showed itself by dull or acute pain indefinitely localised over the lower spine and hip, chiefly on one side, often accompanied by sciatica, and generally relieved by rest. Forward bending was limited by spasm of the hamstrings, and there was local tenderness on deep pressure and flexion of the hip with knee extended was limited. The treatment aimed at flattening the lumbar spine by rest, hot fomentations, and suitable exercises.

Sacro-iliac strain, in contrast to lumbo-sacral strain, usually affected the slender, visceroptotic type with poor posture. Sacro-iliac subluxation was rare, but sacro-iliac joint strain was common. There was referred pain along the first and second sacral nerves, and the tender spots were the inferior sacro-iliac ligament, the sacro-sciatic notch, and sometimes the trunk of the sciatic nerve. The diagnostic points had been well set out by M. N. Smith-Petersen.[1] The treatment was by rest and support, followed by heat, massage, and education to flatten the lumbar spine and undo the forward tilting of the pelvis. Mild cases were relieved by strapping, but usually a light brace and well-made corsets were required for a time. In more resistant cases the joint must be manipulated or ankylosed.

Combined pelvic joint strain.—Clinical features referable to both joints might be found together. An enlarged fifth lumbar transverse process causing pain usually responded to prolonged immobilisation, and support and operation was often successful. A better plan was to ankylose the lumbo-sacral region.

The Pathogenesis of Idiopathic Sciatica.

A mass of reliable evidence was now available to prove that many cases of sciatica could be traced to an anatomical lesion or abnormality in the lumbo-sacral region of the spine. There was localised pain and tenderness on deep pressure, sciatic scoliosis and pain referred along the sciatic nerve, which was not usually tender. Painful semi-sacralisation of the fifth lumbar vertebra was now a well-recognised entity. Abnormalities of the facets were not unusual, and poor posture still further reduced the size of the small foramen, already filled with the large fifth lumbar nerve. Treatment was by prolonged recumbency and immobilisation of the spine, combined with hyperæmia.

Mr. P. J. VERRALL said that in the backache of pregnancy less and less could be ascribed to uterine misplacements, though intrapelvic trouble might lead to pain referred along the third sacral nerve, much more superficial than the pain of sacro-iliac strain. A large factor in the production of this pain was the chronically over-distended rectum. The commonest causes of backache were: (1) Chronic overstrain of the erector spinæ or abdominal muscles. The muscles tried to maintain tone and then gave way, causing low backache in the case of the erector spinæ and lordosis in the case of the abdominal muscles. (2) Fixed flexed hip, due to irritation of the psoas by a chronically inflamed appendix or overloaded sigmoid. In these cases there was always tenderness in one iliac fossa. (3) Subinvolution of the sacro-iliac joints. Relaxation of these joints occurred during pregnancy and the menstrual periods. A subsequent involution similar to that of the uterus should occur. If this failed, backache was the result.

The typical deep tenderness over the sacro-iliac joints was always found, and the other sacro-iliac tests were positive.

In sciatica following pregnancy the question of how much was due to toxæmia and how much to trauma had to be decided. There was no doubt that both fourth and fifth nerves might be injured, as in maternal obstetric paralysis.

Mr. D. MCCRAE AITKEN said that with the present school medical inspection two most fruitful sources of backache—round shoulder and hollow back—were fast disappearing. Crush injuries were much commoner in young children than was generally believed, as they occurred when the bones were still largely cartilaginous. The long back was ill-supported by the erector spinæ and the importance of the oblique and quadratus lumborum muscles was often overlooked. Much of the pain was probably due to quadratus lumborum. "Where you have tension, there you have pain." It was at the origin of the muscles from bone that the strain occurred, and when the muscles gave way the strain fell on the ligaments, causing swelling and pain. In treatment, consideration must be paid to the existence of a toxic element, especially large bowel absorption. In "ricked back" a strip of muscle often got kinked over a bony process producing an elongated swelling. Manipulation would release this strip and give a dramatic cure.

Mr. WHITCHURCH HOWELL agreed that the efficient treatment of round shoulders, hollow back, and scoliosis would go a long way in preventing backache. He discussed the diagnosis of backache, which should be grouped under the headings of: (1) lumbago, (2) anatomical abnormalities, (3) trauma, (4) sciatica.

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[1] Jour. Bone and Joint Surg., 1926, viii., 118.

The latter should be subdivided into true and false (due to pelvic lesions, arthritis of hip, &c.).

Mr. ROCYN JONES said that cases of backache might be divided into two groups—the traumatic and the postural (including the industrial lame backs). Both groups were complicated by infection. Difficulty in diagnosis arose between lumbo-sacral and sacro-iliac lesions. In lumbo-sacral lesions the pain was in the mid-line, there was rigidity of the lumbar spinæ, and the leg-raising test gave equal results on both sides. In sacro-iliac lesions the pain was below the posterior superior iliac spine, the lumbar spine was not rigid, and the leg-raising test caused earlier pain in the affected side. Stereoscopic X rays should always be taken. He stressed the difficulty in the differential diagnosis between sacro-iliac strain and early tuberculous disease. Until bony changes appeared in the latter differentiation was impossible. As regards treatment he agreed entirely with Mr. Cochrane.

Discussion.

Mr. ALAN TODD spoke of the causation of lordosis with backache in young men. Paralysis of the abdominal muscles due to muscular dystrophies, or anterior poliomyelitis and visceroptosis were the causes of several recent cases he had treated. Adequate supports by belts relieved these conditions, but in nonparalytic cases must be regarded as a temporary measure only. He emphasised the need for more orthopædically trained masseuses. This would only be obtained by making orthopædic surgery an essential part of medical training.

Dr. R. MANWARING-WHITE said that practitioners were to a large extent responsible for chronic backache, as the initial injury was often trivial and was then overlooked. The importance of toxæmias must not be underestimated.

Dr. W. A. MARRIS maintained that many cases were due to general ill-health. They were, in fact, "tired backs."

Dr. E. SOLLY complained that many patients were sent to him with a diagnosis of sciatica who were really suffering from an intrapelvic growth, frequently malignant, and not even in an early stage. These should be eliminated by careful rectal examination. Joint disease also often led to an error in diagnosis.

Mr. COCHRANE, in reply, said that he hoped to work on the lines indicated by Mr. Verrall—i.e., the relation of constipation, visceral tone, and other intra-abdominal lesions to backache. He pointed out the difference in the postural and kinetic use of muscles and the importance of physical training. He emphasised the importance of careful rectal examination of all cases.

VOLKMANN'S ISCHÆMIC CONTRACTURE.

Sir ROBERT JONES said that few cases were reported, because there was an idea that this condition conveyed some slur on the treatment; it ought, therefore, to be laid down most emphatically and intelligibly that ischæmic paralysis arose without any carelessness on the part of the practitioner. The essential pathological changes were degeneration of muscle and an increase of connective tissue in their substance, often with absence of sarcolemma nuclei. There was a round-celled infiltration and absence of transverse striation. The process was one of absorption and replacement of dead muscular tissue. The deformity was found mainly in children under 14 after injury to the elbow, and was due to pressure. About 80 per cent. of cases were associated with fracture. In a typical case the wrist-joint was palmar flexed, the carpometacarpal bones were dorsiflexed, the interphalangeals flexed, the hand pronated, and the elbow flexed. As a rule sensation and electric reactions were normal and the fingers could be straightened on flexing the wrist. The skin was blue, cold, and sometimes blistered and scarred. The muscles wasted rapidly and became hard and ropy; if the nerves were sufficiently involved conduction might be partially or wholly lost. Symptoms might appear a few hours after injury, and the damage was often completed in 48 hours. The contracture was preceded by numbness, swelling, muscular rigidity, and sometimes intense pain. If untreated the deformity increased, from contraction of the fibrous muscle and the disproportional growth of bone.

Mild Ischæmia.

Sometimes children were unable, months or years after elbow injuries, fully to flex their fingers. These cases suggested that a slight degree of ischæmia might be quite common, just as blue, swollen fingers might recover after the relief of pressure from splints. Brooks's experiments supported the contention that the hæmatoma within the antecubital fossa might produce venous block quite apart from bony displacement, splinting, or bandaging. Jepson had failed to produce anything but very temporary deformity by the application of splints, casts, and bandages to dogs. A persistent lesion had only been procured by application of an Esmarch bandage after incision and ligation of the femoral vein. If the wound were well drained the contracture could be prevented. The chief factor, therefore, in Volkmann's contracture was a direct pressure from within or without, causing acute obstruction to venous flow. Inflammatory products added to the pressure. J. J. Thomas had found nerve involvement in 60 per cent. of his series.

Prophylaxis.

Under no circumstances, therefore, should an elbow be tightly bandaged. The fracture should be reduced completely and at once. The backward displacement of the humerus must be corrected before putting the arm up in flexion; a sharp projecting upper fragment often added to the internal venous obstruction. Reduction was not easy if postponed for days. The arm should not be bandaged to the forearm nor the elbow to the side, but intelligent flexion was perfectly safe. If a surgeon could not reduce the fracture by manipulation he had better operate than leave it. All circular compression and splints should be avoided, especially if there were much swelling. All cases should be critically watched for the first few days. If great pain, stiffening, swelling, lividity of the fingers, or loss of voluntary movements appeared, the arm should be released from all compression and elevated. The methods of subcutaneous division on the antero-ulnar side of the forearm and of multiple incisions to evacuate the subfascial hæmatoma were worthy of further trial.

The prognosis was always grave, and worst of all when the nerve damage was excessive, when the obstruction to circulation remained pronounced, and when there was only mass movement in the fingers, and the wrist was fully flexed with the forearm fixed in extreme pronation. Treatment of the established condition was mechanical or operative, the aim being to keep the forearm supinated. The former line of treatment consisted in gradually extending first the fingers, then the metacarpophalangeal joints, then the wrist. Physiotherapy had an assured position and should include radiant heat, contrast bathing, oil stupes, gentle massage, and electrical stimulation of the muscles. When a nerve was divided operation was imperative, and the after-care was most important in cases of tenoplasty. Myotomy and tenotomy were not to be recommended. Free excision of the elbow-joint might be indicated when there was contraction of tendons and fixation of the forearm in pronation.

Practitioners must insist on an X ray photograph or a refusal of it in writing, and should warn the patient of the possible serious results of an elbow injury: Volkmann's contracture and myositis ossificans. Further, they should join a medical defence union, for the law might be invoked whatever they did.

Mr. W. ROWLEY BRISTOW pointed out that ischæmic paralysis meant death of muscles, therefore both faradic and galvanic reactions were lost; in the milder cases they would be normal. Nerve suture was worth while, even if the muscles were beyond recovery, as it restored gross sensibility. He emphasised the fact that the position for setting up fractures of the elbow was not " full " or " acute " flexion, but partial flexion across the chest.

Why the Forearm Only?

Mr. D. **McCrae Aitken** remarked that Sir Robert Jones never under any circumstances " stretched " a case " on splints "; he was most careful not to put a limb up in any tension. Volkmann's contracture was one thing—primarily a congestion, a deposition of lymph, and an organisation of fibrous tissue throughout the muscle, producing strangulation; nerve injury was another thing which might occur at the same time and ought to be dealt with at once. He suggested that the reason why the forearm was particularly affected was that its muscles were extremely highly organised with quick and fine reflex adjustments to each other, and therefore highly vulnerable in their function. He quoted a case which suggested that something depended upon re-education of the coördinating movements, and so upon the development of muscles which might not otherwise be restored to function.

Mr. H. **Platt** put forward an anatomical explanation of the susceptibility of the forearm muscles, which arose from a small origin, and swept up obliquely, enclosed in a very tight compartment with a roof of unyielding fascia. Between internal and external condylar groups the biceps tendon was interposed. In this " box " it was easy to get pressure obstructing the venous return along the venæ comites of the ulnar recurrent arteries. The median nerve, passing between the heads of pronator radii teres, inevitably get strangled as the fibrous tissue contracted. A great advantage of operation was that the nerve could be freed and the muscles stripped off the epicondyle, thus giving a very good start.

Mr. D. S. **Middleton** recorded some investigations into Volkmann's myopathy, particularly as it affected the sternomastoid in congenital wryneck. Scar tissue only occurred as a result of muscular death when the venous drainage was obstructed so that the products of autolysis could not be removed by the usual channels. They thus formed an irritating foreign body which was dealt with by the usual process of revascularisation and scar formation. Three or four days after venous ligature all the muscles were invariably found cyanosed, swollen, and necrotic, but a few months later some of them would be found to have recovered. A striking thrombosis occurred in the venous tree and was organised. Probably the temporary interference with venous return produced by ligature was not enough to cause fibrosis, but was converted into a secondary permanent interference by thrombosis.

Anatomically there was little connexion between the deep and superficial venous systems of the forearms below the bend of the elbow, and the venæ comites of the ulnar arteries were much larger than those of the radial. At the bend of the elbow there was a venous plexus that could be covered with a sixpence, and pressure on this meant obstruction to the venous return from almost the whole forearm. The profunda vein entered over the firm fibrous arch connecting the radial with the humero-ulnar origin of the flexor sublimis digitorum. A hæmatoma would force the veins down on to this edge and produce obstruction. Drainage operations therefore seemed reasonable. Mr. Middleton mentioned that of José Jorges, of Buenos Aires, who freely divided all the aponeurotic sheaths in a zigzag fashion to allow expansion and free drainage. If thrombosis had started, however, operation could not be expected to give complete recovery. Mr. Middleton concluded that Volkmann's ischæmic contracture resulted from interference with the venous return by a hæmatoma in a definite, localised spot in the antecubital fossa. It depended therefore on causes associated with the initial injury, and methods of treatment—or the absence of treatment—played a minor part, if any, in its production. It was not yet possible to say which cases would develop this complication, and it was doubtful whether that knowledge would materially assist its prevention.

Discussion.

Mr. **Todd** said that in view of the gross injustice which had recently been done to a member of the profession it was the duty of everyone to record cases of ischæmic paralysis occurring in the absence of any kind of splinting, strapping, or bandaging. He described two such cases, one an extremely bad and hopeless one following a fracture which had lain loose on a pillow without treatment, and the other, less grave, following dislocation of the elbow which had been reduced and sent away in a sling. He pointed out that it was never necessary to use an anterior splint or occlusive plasters for any fracture of the forearm; adequate posterior splintage gave perfect reduction. The teaching that a pad under the anterior splint helped to separate the bones of the forearm was false and pernicious.

Mr. **Howell** recorded some personal experiences, and pointed out that Volkmann's contracture was not a common thing, but that every injury of the elbow-joint ought to bé regarded as a potential ischæmic paralysis. The treatment was to incise the hæmatoma, and to follow in detail Sir Robert Jones's method, by which independent joints were splinted with independent splints by an orthopædic masseuse. It was not possible to get more than a ¾-inch gap at operation without risk to the arterial supply. He described a modification of the collar-and-cuff method which ensured supination from the start.

Mr. P. J. **Verrall** did not agree that ¾ inch was the maximum gap; the muscles could be stripped right across the interosseous membrane without any injury to vessels or nerves, provided always that this operation was never regarded as anything but an adjunct to Sir Robert Jones's stretching method.

Mr. **Rocyn Jones** agreed that the condition might come on without any splinting, and that this fact was one of the most important things to bring home to the public. He was glad to hear stress laid on the value of drainage in cases where there was œdema.

Sir **Robert Jones**, in reply, agreed that " acute flexion " was quite the wrong term for the correct position of fractured elbows, and that force should never be used in stretching the fibrous tissue—it was a real coaxing.

EXHIBITION OF DRUGS, SURGICAL INSTRUMENTS, FOODS, AND APPLIANCES.

The usual trade exhibition was opened in the Drill Hall, Cardiff, on July 24th. A brief notice of the more important exhibits is given below, and will be concluded in the next issue of The Lancet.

Drugs and Pharmaceutical Preparations.

1. *General Drug Exhibits.*

[46] Allen and Hanburys, Ltd. (Bethnal Green, E. 2), drew attention to the fact that their " Allenburys " infant foods now have added to them a proportion of synthetic vitamin D, ergosterol, so that they fully protect against rickets. Among the " Azoule " brand sterile hypodermic ampoules are sodium salicylate and urethane preparations for the treatment of varicose veins. Liver extract for pernicious anæmia is prepared in powder, tablets, and capsules. " Charkaolin " is a new preparation for fermentative intestinal infections, combining the absorbent properties of vegetable charcoal with the toxin-adsorbing qualities of " Osmo " kaolin. A new laxative is " Byno Chrismol " with a cold-water extract of senna pods. " Iodolysin " is a fibrolytic agent for rheumatoid arthritis and allied conditions.—[60] Bayer Products, Ltd. (19, St. Dunstan's-hill, E.C. 3), showed a series of their well-known preparations, such as " Adalin," " Luminal," and " Plasmo-

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Mr. W. ROWLEY BRISTOW pointed out that ischæmic paralysis meant death of muscles, therefore both faradic and galvanic reactions were lost: in the milder cases they would be normal. Nerve suture was worth while, even if the muscles were beyond is now supplied in an improved atomiser with a cap.—[87] Behring Institute (Marburg-L., Germany, and W. Bredt, 41, Great Tower-street, E.C. 3) were showing again their delightfully convenient " Vacuum Venule " for the collection of blood samples, as well as " Yatren " in pills, powders, and solutions, and " Yatren-Casein " for protein shock therapy.—[49] Bristol-Myers Co. (112, Cheapside, E.C. 2) showed " Sal Hepatica," a saline regulator; " Ziratol," a non-toxic naphthaline antiseptic; and " Ipana," a tooth-paste containing Ziratol.—[6] G. W. Carnrick Co. (Brooks and Warburton, Ltd., 40–42, Lexington-street, W. 1) needed no introduction with their " Hormotone," " Trypsogen," " Secretogen," " Kinazyme," and other glandular compounds, but reminded the profession of the care with which these are prepared and standardised.—[67] Deshell Laboratories, Ltd. (Braydon-road, N. 16), argued once more the superiority of " Petrolagar " in its four forms: plain, unsweetened, alkaline, and with phenolphthalein. They laid stress on its value for cleansing, evacuating, or retention enemata, as it is miscible with anything, allays spasm, and holds the medicament in even dissemination on the mucous surface.—At Stand [26] Eno's Fruit Salt (Pomeroy-street, S.E. 14) held its own, and was a refreshing draught in the heat of the opening day.—[14] Ichthyol Co., Ltd. (18, Adam-street, W.C. 2), introduced " Albichthon," a colourless sulphur preparation from the raw material of ichthyol, an effective bactericide and clean to handle. Bristow's medicated " Ichthyol " toilet preparations were also on view.—[17] Jeyes' Sanitary Compounds Co. (London) showed a refined preparation of " Cyllin " for medical and surgical use, with a Rideal-Walker coefficient for *B. typhosus* of 24 to 26; as well as capsules for intestinal antisepsis, pastilles for the throat, soap powder, and dental and shaving cream.—[7] Kaylene, Ltd. (7, Mandeville-place, W. 1), this year emphasised the value of their colloidal silicate of alumina in infantile diarrhœa.—[71] Mond Staffordshire Refining Co., Ltd. (47, Victoria-street, S.W. 1), showed for the first time the " Monsol " products: pastilles, ointment, capsules, and anti-mosquito stick. The manufacturers maintain that Monsol is practically non-toxic and can be used intravenously, and that a 1/1000 solution is equivalent to 1/40 lysol at one-tenth of the price.—[84] The Saccharin Corporation, Ltd. (72, Oxford-street, W. 1), showed " Novocain " in powder, tablets, and solution, and " Glaucosan," a new and very strong myotic prepared by Dr. C. Hamburger, of Berlin, for the treatment of glaucoma.—[57] Scott and Turner, Ltd. (Gallowgate, Newcastle-upon-Tyne, and 211, Blackfriars-road, E.C. 4), dispensed " Andrews' Liver Salt " as in previous years with no sign of diminished activity.—[83] The Semprolin Co., Ltd. (18, Leather-lane, E.C. 1), prepare a wide range of emulsions of high viscosity paraffin, of which perhaps the most interesting are those containing respectively guaiacol and salol. " Carmex " is a soothing laxative mixture for infants. The firm are glad to find that the fact that their products are entirely British is being appreciated by the medical profession.

3. *Toilet Preparations.*

[33] Kolynos Inc. (Chenies-street, W.C. 1) and [31] Pepsodent Co. (42, Southwark Bridge-road, S.E. 1) presented their well-known dental creams. The former also showed a skin soap, liquid Kolynos for mouth-wash or gargle, and a denture powder, and the latter demonstrated the rotary cleansing action of their " Decoater " toothbrush.

FOOD AND DRINK.

[32] Benger's Food, Ltd. (Otter Works, Manchester), displayed the unique features of their food by a series of slides, and reminded the profession of the value of their peptonised beef and chicken jelly, extract of red marrow, and essence of rennet.—[41] Cadbury Bros., Ltd. (Bournville), emphasised the food value of milk chocolate, in every half-pound of which there are one and a half glasses of full cream milk.—[51] Maison Ackermann-Laurence (St. Hilaire-street, Florent, France) gave special prominence to an exhibit of sparkling Saumurs; their Brut Royal is free from tannic acid and excess of sugar and alcohol, and is rich in ethers. On the same stand Messrs. Francesco Cinzano, of Turin, exhibited Italian vermouth free from preservatives, wormwood, and wood spirit.—[1] Energen Foods Co., Ltd. (Willesden, N.W. 10), showed their wide range of foods, originally prepared for diabetic patients but now used in all metabolic disorders (see THE LANCET, 1927, ii., 1337). Their " Endobran " biscuits are prepared according to Dr. Poulton's formula, with a low carbohydrate and a high fat content.—The attendance at Stand No. 95, that of William Gaymer and Son, Ltd. (Attleborough and London), showed no sign of diminishing during the whole of the Exhibition. Their " Special Dry Still " cyder is recommended for diabetics and sufferers from gout. Sufferers from heat benefited from their " Medium Dry " and " Medium Sweet."—[30] Granose Foods, Ltd. (Watford), showed their crisp, steam-cooked biscuits made from whole wheat.—[93] H. A. G. Coffee Co., Ltd. (40, Theobalds-road, W.C. 1), dispensed refreshing cups of their coffee, and showed alarming specimens of the caffeine which had previously been extracted from the bean.—[80] Horlick's Malted Milk Co., Ltd. (Slough, Bucks), have added to their well-known milk preparation a pleasant malted milk toffee, and lay stress on the value of their shadow-food, consisting only of two ounces of malted milk, four ounces of barium sulphate, and water. A new mixer was also demonstrated.—[65] Ingram and Royle, Ltd. (45, Belvedere-road, S.E. 1), showed the many mineral waters for which they are agents, including Vichy-Célestins, Contrexeville, Carlsbad, and Hunyadi János.—[23] Keen, Robinson and Co., Ltd. (Carrow Works, Norwich), testified to the continued success of Almata as a food for infants, invalids, and nursing mothers, and have issued a new prescription for the preparation of their " Patent Barley," so that the mother is saved the trouble of preparing barley-water first. Robinson's Groats, Robinson's Oats, and Keen's Mustard Ointment need neither introduction nor recommendation.—[8] Montgomerie and Co., Ltd. (Ibrox, Glasgow), showed Berina Infant Foods and Berina Malted Milk invalid diet, as well as Bermaline Bread.—[70] Nestlé and Anglo-Swiss Condensed Milk Co. (6 and 8, Eastcheap, E.C. 3) emphasised the vitamin content, bacterial purity, and dietetic value of their full-cream milk and malted wheaten products.—[45] Oxo, Ltd. (Thames House, Queen-street-place, E.C. 4), had a new preparation, " Liveroid," for pernicious and general anæmia. To their " Oxoid " standardised endocrine preparations they have now added an ovarian and a parathyroid.—[61] Alexander Riddle and Co., Ltd. (Bancroft-road, E. 1), demonstrated practically the refreshing properties of Stower's Lime Juice, Lemon Squash, and Orange Squash.—[11] Vitalia, Ltd. (17A, Boniface-street, S.E. 1), showed that " Vitalia " Meat Juice with soda-water could be a refreshing drink as well as a valuable food.—[82] West Surrey Central Dairy Co., Ltd. (Guildford), have added to their well-known " Cow and Gate " infant food two new preparations: " Brestol," a humanised cream of standardised fat, protein and vitamin content, and " Lacidac," an acid milk powder with a hydrogen-ion concentration when reconstituted of pH 4·6.

SURGICAL INSTRUMENTS.

[46] and [63] Messrs. Allen and Hanburys, Ltd. (48, Wigmore-street, W. 1), called *especial* attention to their improved " St. Bartholomew's Hospital " pattern operation table, with new patent self-locking device for obtaining the Trendelenburg position, overhung by the " Pantophos " shadow-free light, in which heat and glare are eliminated. Among their large selection of stainless steel surgical instruments may be mentioned Souttar's craniotome, scalp clips, and steam cautery; Sargent's skull and laminectomy instruments; Tudor Edwards's thoracotomy instruments; Rowland's fasciatome for living sutures; Cope's universal " Duralumin " splint for Colles

quine" for malaria, and drew special attention to "Compral," a rapid analgesic without hypnotic effect; "Phanodorm," an hypnotic for general practice without cumulative action; "Theominal," a combination of luminal and theobromine for arteriosclerotic conditions; "Hexeton," a water-soluble synthetic camphor preparation for intramuscular and intravenous use; "Novasurol," a water-soluble preparation containing 33·9 per cent. of mercury in a complex non-ionisable form; and "Vigantol," a biologically standardised preparation of irradiated ergosterol, put up in pellets, ovoids, and a 1 per cent. solution in oil, of which 25 drops equals 10 mg. of vitamin D.—[39] Boots Pure Drug Co., Ltd. (Station-street, Nottingham), presented a series of pharmaceutical and toilet preparations, including "Columbrin," "Stabilarsan," "Thiostab," and "Bismostab."—[81] W. Bredt (41, Great Tower-street, E.C. 3) exhibited the "Ysates," dialysates from fresh plants, notably "Digitalysate," "Valerian-Digitalysate," and "Viscysate," prepared from *Viscum album* for conditions of high blood pressure. "Thilocologne," the preparation of ethyl chloride with eau-de-cologne, is now obtainable with a drop nozzle instead of a jet.—[20] Crookes Collosols (22, Chenies-street, W.C. 1) showed all their well-known colloidal preparations, such as argentum, iodine and manganese, and some new ones, including "Collosol Metallic Bismuth," a 5 per cent. preparation of finely divided metal which is usually absorbed within 10 days of injection, and "Collosol Mercurochrome" in dry scale preparation and sterile solution, standardised to obtain a definite percentage both of mercury and bromine. "Collosol Lactomagnesia" contains approximately 10 per cent. of magnesium hydroxide, and acts as an adsorber, a mild laxative, and a neutraliser without the evolution of gas. This firm also make some agreeable semi-toilet preparations, including "Collosol Argentum" tooth-paste and "Collosol Zinc" vanishing-cream.—[58] The British Drug Houses, Ltd. (Graham-street, N. 1), displayed their "Æther Puriss"; "Chloroform Puriss"; a non-clogging powdered liver extract, and their vitamin products, "Radiostol," "Radiostoleum," and "Radio-Malt," as well as "Caprokol," their urinary antiseptic; "Caprokol Antiseptic Solution S.T. 37," and their "Ergotoxin Phosphate," as used by A. Bourne and R. Burn.—[43] Burroughs, Wellcome and Co. (Snow Hill Buildings, E.C. 1) gave a prominent position to "Ephedrine," for asthma, hay fever, and leprosy; to "Allipol," the sodium salts of the less irritating fatty acids of hydnocarpus oil, and to "Avenyl," for leprosy complicated with syphilis. They also showed "Wellcome" liver extract and a representative display of standard drugs, sera, vaccines, and tuberculins.—[59] Evans Sons, Lescher and Webb, Ltd. (50, Bartholomew-close, E.C. 1), showed the various pharmaceutical specialties of this firm and the "Medi-soaps" manufactured by Charles Midgley, Ltd., of Manchester. Careful selection, preparation, and standardisation go to the making of this firm's gland products, which now include "Thymus Co.," "Mammary Co.," "Thyrosex Co.," and "Sexatones." This firm claim that their "Hepatex" is the cheapest and most concentrated liver extract on the market, one drachm being equivalent to two ounces of fresh liver. Their "Infundibulin" is now supplied in a special narrow-necked ampoule which can be opened without a file.—[35] Fassett and Johnson, Ltd. (86, Clerkenwell-road, E.C. 1), added to the well-known Angier's Emulsion and "California Syrup of Figs" a display of "Bemax," the new vitamin B preparation made from the detoxicated embryo of cereals.—[47] Ferris and Co., Ltd. (Union-street, Bristol), showed a series of fine chemicals and pharmaceutical preparations, particularly those of Martindale's "New Pharmacopœia"; also glandular products, cheap sterile accouchement outfits, and surgical dressings, specially set up in cabinets of "Ever-ready Caddies."—[27] Genatosan, Ltd. (Loughborough, Leicestershire), are very familiar for their "Sanatogen," "Genasprin" and "Formamint," and were displaying, as well as detoxicated and ordinary vaccines, their local immunity products, including an anticoryza vaccine spray.—[24] The Hoffmann-La Roche Chemical Works, Ltd. (51, Bowes-road, N. 13), draw special attention to their "Allonal" non-habit-forming hypnotic and analgesic, and "Isacen" non-toxic synthetic aperient, which gradually liberates di-hydroxyphenyl-isatin under the influence of the alkaline secretions of the intestine. "Somnifaine" is a liquid hypnotic of the barbituric group which can be administered orally, intramuscularly, or intravenously.—[10] J. F. Macfarlan and Co. (109, Abbey-hill, Edinburgh, and 32, Bethnal Green-road, E.1) showed a series of pure pharmaceutical chemicals, including alkaloids and capsules of amyl nitrite; anæsthetics, especially ethyl chloride, and dressings and ligatures.—[28] Oppenheimer, Son and Co., Ltd. (179, Queen Victoria-street, E.C. 4), stressed their new vitaminised preparations, such as "Vitad," a concentrate of the unsaponifiable fraction of cod-liver oil, 100 times stronger than the natural oil. This is supplied in "Palatinoids," equivalent to one teaspoonful and one tablespoonful respectively of the fresh oil. The little capsules make a most convenient vehicle of administration for young children. Irradiated ergosterol is also put up in "Palatinoid" form, and "Malt and Vitad" is a preparation equivalent to a 25 per cent. cod-liver oil and malt, but free from the unpleasant oily fraction. "Vitad" is also put into the well-known reconstructive food, "Roboleine."—[41] Parke, Davis and Co. (50-54, Beak-street, W. 1) demonstrated their recognised remedies, including quinine hydrochloride and urethane solution for sclerosing varicose veins, and also many recent introductions, such as "Adrephine," an aqueous solution for local use, combining the rapid relief of adrenalin with the sustained action of ephedrine; "Metatone," a tonic elixir containing vitamin B, nucleinic acid, and glycerophosphates; and "Paroidin," a standardised extract of bovine parathyroid glands for injection. "Oxytocin" is the pituitary substance that acts on involuntary muscle, and "Vasopressin" is the pituitary pressor principle. These two preparations will soon be on the market. Puerperal septicæmia streptococcus antitoxin is available for prophylaxis and therapeusis, while the series of "Immunogens," originating in the P., D. and Co. Laboratory, is now a long one.—[50] The Sandoz Chemical Works (5, Wigmore-street, W. 1) had on view their well-known products "Femergin," "Felamine" and "Bellafoline." "Allisatin" is their tasteless preparation of garlic. "Calcium-Sandoz" is obtained from an oxidation product of glucose by a special process and contains 13 per cent. of lime. "Sandoptal" (isobutyl-allyl-barbituric acid) is a new safe hypnotic, well tolerated by the aged.—[62] Schering-Kahlbaum, Ltd. (3, Lloyd's-avenue, E.C. 3), emphasised the value and safety of their non-narcotic analgesic "Veramon," and introduced "Solganal," a new gold product of low toxicity, particularly useful in leprosy, a 15-g. dose of which can be given with safety. Two other new products are "Vasano," camphoric acid salts of mandragora alkaloids, for train, air, and sea sickness, and "Synthalin B," a much less toxic product than the old Synthalin. "Atophan Balsam" is an amyl ester of "Atophan" for inunction.—[54] W. A. Wharram, Ltd. (31, Lady-lane, Leeds), make several popular pepsin preparations, such as "Liq. bismuth co. c. pepsin," and very many other therapeutic products. Mention may be made of ephedrine tablets for oral administration; "Linctus heroin hydrochlor. c. turpin. hyd."; "Syr. pulmonaria Co.," containing codeine phosphate, guaiacol, and calcium phosphate; "Ung. analgesic," a combination of methyl salicylate, menthol, eucalyptol and camphor; and "Ung. stimulans," a mustard preparation useful for rheumatic and neuralgic conditions.

2. *Special Drug Exhibits.*

[22] Anglo-American Oil Co., Ltd. (Albert-street, N.W. 1), pointed out that the price of their "Nujol" has now been considerably reduced, and that "Mistol"

formally opened. For a long time its financial basis was somewhat insecure, for the capital had been lost by the inflation of currency; but Prof. Kräpelin succeeded in interesting the Rockefeller Institution in the matter, and they furnished the necessary funds on condition that a certain sum was collected for working the institute. The fund thus opened found subscribers both in Germany and the United States, including Baron Krupp, of Essen, and Mr. James Loeb, of New York, and at last it has been possible to open the new building. It has departments for histopathology, topographical anatomy, serology, genetics, and psychology respectively. A chemical department under the celebrated analytical chemist, Prof. Willstätter, is to be opened in the near future. Besides the lavishly fitted laboratories there are rooms for collections and archives. At the opening ceremony, which was held in the presence of State and municipal authorities, Prof. Bouman, of Utrecht, presented a sum of M.20,000 (£500) in the name of a foreign committee. The Kräpelin gold medal was conferred upon Prof. Oscar Voigt, of Berlin, for his researches in the structure of the cerebral cortex.

Venereological Expedition to Russia.

The German Association for Aiding Scientific Research, in coöperation with the Health Department of the Soviet Republic and the Russian Academy of Sciences, has arranged an expedition to Russia for the study of syphilis. It is stated that in Europe syphilis has undergone an alteration under the influence of civilisation. It is thus essential to study it among a rather primitive population where it has been systematically combated for only a few years. As a suitable locality the Burjato Mongolian Republic situated beyond Lake Baikal has been chosen. Two German medical men went there last year to select a place for the research and they found that a town called Kulskoe would be convenient for the purpose because it possesses a hospital. The German Association has supplied the necessary apparatus and has fitted out a large serological laboratory. The Russian Government have promised to care for the housing and the maintenance of the staff, to have the hospital enlarged and modernised, and to facilitate as much as possible the work of the expedition. Acquired and hereditary syphilis will be studied by bacteriological and serological methods, and the results compared with those obtained in Europe. The expedition will include syphilologists, internists, and neurologists, and the German party, which will work under the direction of Prof. Hessner, of the Clinic for Venereal Diseases in Breslau, includes Dr. Klemm and Dr. Patzig, of the Institute for Cerebral Research in Berlin, Dr. Beringer, of the University Clinic for Nervous Diseases in Heidelberg, three women laboratory assistants, and an engineer to look after the apparatus. From Russia, where the Government shows great interest in the work, eight medical men, belonging to the staff of the State Institute for Venereal Diseases, will attach themselves to the expedition.

Dr. Wentzler, head of an infants' home in Berlin, says that in his institution the throat of every infant, even if healthy, is daily examined by a nurse, redness or any other abnormal condition being at once reported to the doctor. This makes it possible to detect suspected cases of illness at the earliest possible moment, and so prevent epidemics of diphtheria and scarlet fever from developing. Owing to the recent increase of diphtheria observed here, he recommends that the same measures should be taken in the schools. A nurse should be placed at the school entrance, whose duty it would be to examine the throat of every child. Where any reddening was discovered entrance to the school would be refused until the child had been examined by the school medical officer, who would decide whether an infectious disease was developing, and whether the child might be admitted to school.

MEDICINE AND THE LAW.

Imprisonment for "Nature Cure Practitioner."

MEDICAL practitioners are thinking quite as much of the public as of themselves when they deprecate the indiscriminate and unskilled use of ultra-violet ray and similar treatments. The possibilities of this kind of thing in the hands of amateurs are endless. During last month William Patrick Faulkner, a carpenter, was prosecuted at Marylebone Police-court on charges of obtaining certain sums by false pretences from Ernest Rose, another carpenter. It appeared that the two had entered into partnership and had opened a sun ray clinic and nature cure establishment in Praed-street, with a brass plate describing them as "Drs. Faulkner and Rose, nature cure practitioners and manipulative surgeons." Faulkner had made an agreement with Rose, which it was stated was signed "William Patrick Faulkner, M.D.," providing that each of them should put £50 into the concern and that they should share the profits. It was said that Faulkner told Rose he had just come from Ruskin College, Oxford, and was qualified as a doctor of medicine at King's College, also that he owned a house at Thornton Heath worth £1000. Believing these representations, Rose seems to have parted with about £130 in all. This included £4 which Faulkner seems to have obtained for the purpose of registering with the General Medical Council and 8 guineas for the purpose of registering with the L.C.C. Faulkner was not in fact on the Medical Register and did not pay the 8 guineas to the L.C.C. Mr. Wallace, appearing for the Director of Public Prosecutions, said Faulkner had been previously convicted for falsely pretending to be a registered medical practitioner, and also for obtaining money by false pretences. Mr. Wallace observed, as a warning of the dangers of sun ray treatment by unqualified persons, that one patient, who paid Faulkner a cheque for £6 and had treatment two or three times, was finally sent to hospital where she was found to be suffering from appendicitis. Had she continued her treatment with "Drs. Faulkner and Rose" much longer she would probably have ceased to require any treatment at all. Mr. Bingley, the magistrate, who passed sentence on Faulkner of three months' imprisonment with hard labour on each of two charges (making six months in all), agreed as to the grave danger to the public if people carried on such treatment unless properly qualified. The London County Council will presumably take note of the case. If their statutory powers of controlling such establishments are inadequate, they should be amplified forthwith.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. R. F. MacMahon is placed on Retd. List with the rank of Surg. Capt.

Surg. Comdrs.: R. J. G. Parnell to *Barham*, and as squadron medical officer and for specialist duties (on transfer of flag): and G. H. Hayes to *Warspite* (on transfer of flag).

Surg. Lt.-Comdr. S. R. Johnston to *Vulcan*, temp.

Surg. Lts.: J. J. Keevil to *Barham* (on transfer of flag): and C. H. Egan to *Warspite* (on transfer of flag).

Surg. Lt. (D) H. V. Pell to *Pembroke* for R.N. Barracks, Chatham.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lts. J. M. McC. Wright and J. Stephen to *Victory* for Haslar Hospl., for training.

Prob. Surg. Sub-Lts. E. G. Thomas, R. P. Davies, and D. A. Williams to *Victory* for Haslar Hosp. for training.

ROYAL ARMY MEDICAL CORPS.

Majs. to be Lt.-Cols.: H. T. Wilson, vice Lt.-Col. H. C. Sidgwick, to retd. pay: and R. C. Hallowes, vice Lt.-Col. (Bt. Col.) P. H. Henderson, promoted.

fracture; gynæcological instruments made for Messrs. Comyns Berkeley and Victor Bonney, and rectal instruments for Sir Charles Gordon Watson; the "Rotanda" blood transfusion syringe; a unique ratchet for retractors; British cystoscopes, and the light "Oslite" head-lamp.—[9] Albert Brown, Ltd. (Chancery-street, Leicester), showed a selection of stainless steel instruments and electric sterilisers, in particular Georg Wolf bladder instruments with Zeiss optics, a true-colour filter being built into them so that the eye can follow the movements of a lithotrite and see the bladder contents in their natural colours without fatigue. An interesting head lamp for ear, nose and throat work was fitted with an iris diaphragm and focusing lenses, so that the light could be intensified on a small area without dazzle.—[93A] Perhaps the most interesting exhibit in the whole show was that of Cameron's Surgical Speciality Co. (15, Stratford-place, W. 1). This apparatus provides, at a price well within the reach of the general practitioner, an endoscopic and inspection series which can be illuminated from any electric light plug and which the makers guarantee to be absolutely shock-proof and "fool-proof." The nasal sinuses can be transilluminated, root apices revealed, and foreign bodies detected; the retina can be lit up by pressing the bulb against the lower eyelid, and the veins are thrown into strong relief by pushing it into the soft tissues of a limb, so that intravenous injection in fat subjects loses its horrors. For the surgeon there are abdominal lights, which are guaranteed to withstand repeated sterilisation by boiling or steam pressure. The light used is of a wave-length peculiarly suitable for penetrating soft tissues. We advise every practitioner to inspect this for himself.—[76] C. W. Dixey and Son (13, St. Andrew's-crescent, Cardiff, and 3, New Bond-street, W. 1) showed a series of ophthalmoscopic instruments, particularly the Aves deviograph for testing the muscles of the eye.—[42] Down Bros., Ltd. (21 and 23, St. Thomas's-street, S.E. 1), included in their exhibit ox-bone plates and screws by Hamilton Bailey; Howarth's improved model of Chevalier Jackson's bronchoscopy and œsophagoscopy instruments; Souttar's counterpoised direct electric motor; Ivan Magill's portable intratracheal apparatus for anæsthesia; blood transfusion apparatus by Macintosh and others; and the "Up-to-Date" operation table with recent improvements.—[73] The Genito-Urinary Manufacturing Co., Ltd. (28A, Devonshire-street, W. 1), who are also agents for J. Eynard, Paris, showed a wide range of cystoscopes, bladder and kidney instruments, and diathermy apparatus.—[52 and 69] The Holborn Surgical Instrument Co., Ltd. (26, Thavies Inn, E.C. 1), had on view a large selection of modern surgical instruments in ordinary and stainless steel, including Kidd's female urethroscope; MacReynold's tonsil artery forceps; Guttmann's self-retaining vaginal speculum; the "Speclite" lamp, to clip on to the nose-piece of a shellite spectacle-frame, and the light, compact "Holborn" pocket head-lamp with elastic head-band.—[34] Mayer and Phelps (Chiron House, 59–61, New Cavendish-street, W. 1) pointed out their "Empire" operation-table, in which the Trendelenburg position can be obtained with perfect safety, and in which an improved lumbar bridge has been incorporated; Rowling's anæsthetic table; an outfit to supply a warmed atmosphere of either oxygen, nitrous oxide, or carbon dioxide, or of any percentage combination, with or without chloroform vapour; the "Chiron" fool-proof chloroform inhaler; Eadie's ligature forceps; and Canny Ryall's portable pelvic elevator.—[19] Rayner and Keeler, Ltd. (9, Vere-street, W. 1), showed various ophthalmoscopes and perimeters and a modified simple ophthalmic bracket which can be fastened above the patient's head and swung round in front of him. They also had on view various operating lamps and test types.—[12] The Surgical Manufacturing Co., Ltd. (83–85, Mortimer-street, W. 1), had a selection of new diagnostic instruments, including the Lilliput head-lamp; a new mercurial sphygmomanometer; a new combined ophthalmoscope, laryngoscope, and auroscope; the Servic steriliser for dressings, and a convenient new iodine container by means of which tincture of iodine can be carried about in a pocket and applied to the patient without staining of clothes or instruments.

(*To be concluded.*)

Special Articles.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Statistics of Venereal Disease.

IN December of last year a census of venereal patients was taken by the Health Office and the results have now been published. It is stated that the registration schedules sent to the medical profession have been answered by 93·6 per cent. of the general practitioners, 95·5 per cent. of the venereologists, and 97·5 per cent. of the hospitals and sanatoriums to whom they were sent, from which it is evident that the profession has taken great interest in the inquiry. The figures show that in Germany there were 18,608 patients who first came for treatment within the period Nov. 15th to Dec. 14th. Of these, 432 suffered from more than one venereal disease, 76 per cent. had gonorrhœa, 2·1 soft chancre, 5·3 per cent. primary syphilis, and 15·1 per cent. secondary syphilitic symptoms. Compared with 1919 the figures indicate a reduction by one half.

Phosgene Poisoning.

The regrettable accident at Hamburg, where an escape of phosgene caused the death of about 20 persons and the illness of some hundred others, has drawn our attention to the properties of this poison. Prof. Straub, of Munich, states that it is a very labile substance much used in the chemical industry—for instance, in the production of fuchsine. It may easily be condensed into a fluid and on contact with wet air this fluid is decomposed, developing chlorine and hydrochloric acid. These corrode the bronchi and produce broncho-pneumonia. Phosgene may also enter the living cells and bring about their death and has thus a delayed effect on the organism. The gas is produced when chloroform vapours come in contact with a flame, and intoxication from this cause used to occur sometimes in the days before operating theatres were fitted with electric light.

An International Conference on Scarlet Fever.

A conference of German and Russian medical savants, medical officers, and hospital physicians was held not long ago at Königsberg for the purpose of exchanging views on scarlet fever. Dr. Deicher (Berlin) said that in his experience antistreptococcal serum had proved very efficacious, no patient having died to whom the serum was administered in an early stage of the disease. When serum was used complications also had been rarer and less severe. Prof. Korschun (Moscow) and Dr. Bardach (Odessa) described methods of testing the efficacy of the individual serum. The Russian members of the congress reported that in their country prophylactic injections had been made in some 100,000 children and it had been ascertained that the protection lasted about nine months. This short duration is somewhat surprising as persons who have had scarlet fever are generally immune for a long period—even for the rest of their lives.

Cerebral Research.

The German Institute for Cerebral Research, founded by the late Prof. Kräpelin, has now been

It is not quite clear whether the S and R forms, which Commanders Dudley and Parker found to be contrasted in toxigenicity, were from different sources or were both derived in each instance from a single strain. In the former case the reasons for believing that they were all *C. diphtheriæ* are required to complete the evidence. Definition of a species in bacteria is difficult as Commander Dudley admits, and the assignment to *C. diphtheriæ* of a culture which is neither toxigenic nor descended from a toxigenic strain is a difficult and often unconvincing task.

The study of variation in bacteria is not yet very far advanced, but definite variation in antigenic constituents has already been described in several instances and found related to more obvious changes in character. There is also good evidence that antigenic composition may be closely connected with some factor in the composite character known as virulence. This is notably the case in the factors which have been studied both chemically and biologically by Avery, Heidelberger, and others—e.g., in the pneumococcus. It therefore seems probable that even in so variable a group as the bacteria tangible evidence of orderly variation will further accumulate and prove to be of wide theoretical and practical value.

I am, Sir, yours faithfully,
JOSEPH A. ARKWRIGHT.

Lister Institute, S.W., August 7th, 1928.

THE HEREDITARY AND CONSTITUTIONAL FACTOR IN ADDISON'S (PERNICIOUS) ANÆMIA.

To the Editor of THE LANCET.

SIR,—In your annotation last week on the Intestinal Bacteria in Pernicious Anæmia you state that the evidence for an hereditary or constiutional element in the disease is "rather nebulous." In a lecture published in THE LANCET five years ago I brought forward what I regarded as conclusive evidence in favour of such an hereditary or constitutional element. I believe this conception is of fundamental importance in the pathogenesis, prophylaxis, and treatment not only of Addison's anæmia (A.A.), but also of the associated nervous disease—subacute combined degeneration of the spinal cord (S.C.D.). I should like once again to summarise the evidence on the subject, as many further observations bearing on it have been made since the publication of my lecture.

The absence of hydrochloric acid from the gastric secretion appears to be the one essential predisposing cause of the two allied diseases. It is most frequently due to constitutional achylia gastrica, an inborn error of secretion, which is strictly comparable with Garrod's inborn errors of metabolism, such as cystinuria, alkaptonuria, and pentosuria. The error is one of function and not of structure, as the mucous membrane is normal and has a normal number of oxyntic cells. Achylia was present in 4 out of 100 healthy students examined by Bennett and Ryle at Guy's Hopsital: it occurs in early childhood, and is often present in several members of a family. Martinez has observed more than 20 such families, in one of which a great-grandmother, her daughter, four grandchildren, and five out of 13 great-grandchildren had achylia. I have had under my own care a brother and sister and two sisters with digestive symptoms caused by achylia gastrica.

The familial occurrence of achylia gastrica must be the explanation of the familial occurrence of A.A. which has been recorded by many observers. I have collected no less than 62 family histories from the literature, and 7 out of a series of 25 cases at New Lodge Clinic (27 per cent.) had one or more relations who had died of the disease.

Liepelt records the case of a mother and daughter both of whom suffered from S.C.D., and of a father and son with the disease, the grandfather having died of A.A. Willson, in 1912, described the case of a woman with S.C.D., two of whose maternal aunts had died of A.A. I have set with a similar family history in 4 out of 16 private patients with the disease: the mother of one and the paternal grandfather of another died of A.A. The most remarkable case was that of a doctor who died of S.C.D. associated with achylia gastrica and A.A.; his brother, father, paternal uncle, and paternal grandfather had all died of A.A. The brother of another doctor with severe A.A. and slight S.C.D. was found to have S.C.D. and achylia, but perfectly normal blood.

Five patients, who have consulted me for various conditions associated with achlorhydria, had one or more relatives who had died of A.A. I have collected records of 28 other cases in which A.A. in one or more members of a family was associated with achylia in others. The brother of a doctor of 42, who consulted me for digestive symptoms due to achlorhydria, had died at the age of 41 after being ill for 18 months with S.C.D. and terminal severe anæmia, and Evans has described the case of a man with S.C.D. and achlorhydria but no anæmia who had a sister with achlorhydria. Dorst has described a family, different members of which had either A.A. or S.C.D., or achlorhydria without nervous symptoms or anæmia.

A woman of 50, who was feeling quite well except for occasional diarrhœa and eczema, sought my advice mainly because she had become worried about herself owing to the number of relations on both sides of her family who had died of Addison's anæmia. Her sister, paternal grandmother, and a cousin of her father's had died of it, a paternal cousin of her own had it now, and her mother died of it. Her tongue, which had been sore from time to time for three years, had the characteristic appearance of Hunterian glossitis. Her hæmoglobin percentage was 76 with 4,100,000 red corpuscles per c.mm., and the average size of the red corpuscles was increased from the normal of 7·23 μ to 8·31 μ, but the red cells were otherwise perfectly normal in appearance. She had complete achlorhydria.

In connexion with the bacteriology of Addison's anæmia I regret that you make no reference to the important observations of Knott on the subject, most of which have been published in the Guy's Hospital Reports, as the more recent investigations of Dr. Stanley Davidson, which form the basis of your annotation, do little more than confirm his pioneer work.—I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, August 6th, 1928.

INSTRUCTION IN PSYCHIATRY.

To the Editor of THE LANCET.

SIR,—Your review of Dr. H. J. Norman's book on Mental Disorders (July 21st, p. 125) will be approved by many of the older school of psychiatry. Yet it is disconcerting to find approval of a book, intended for students, on the ground that it does not deal with modern psychopathology. The most elementary knowledge of mental processes is withheld from our students. The metaphysical nature of the effort to correlate disordered conduct with disordered neurones, and its entire failure and practical futility in the psychoneuroses, are concealed from them. The mental attitude thus induced often persists throughout professional life in people of a certain temperament. Others make the discovery that something is wrong with their education or philosophy and feel helpless when faced with the many psychoneuroses of general practice, with only their traditional training in "neurones" to fall back upon. I am often asked by practitioners where they can learn about these matters, and where they can meet others of similar inclination to discuss their clinical difficulties and find out what is to be learnt from modern psychopathology. For this reason I ask the indulgence of your columns to notify that an effort is being made to form a small

Capts. to be Majs.: R. D. Cameron (Prov.), W. J. F. Craig, J. Bennet (Prov.), W. C. Connell, and G. B. Wild.

Lts. to be Capts.: T. A. J. M. Dodd, R. A. Bennett, W. H. Carter, W. A. D. Drummond, J. G. E. Vachell, J. N. Atkinson, J. D. Corner, and J. T. Smyth.

Lt.-Col. H. C. Sidgwick retires on retd. pay.

Majs. A. W. Howlett, G. S. Parkinson, and J. Startin retire on retd. pay.

Temp. Lt. D. J. Allan relinquishes his commn.

TERRITORIAL ARMY.

Maj. J. H. Owens to be Lt.-Col. and to comd. the 161st (E. Anglian) Fd. Amb., vice Lt.-Col. (Bt. Col.) S. J. Fielding, vacated.

Maj. T. E. A. Carr, from T.A. Res., to be Capt., and relinquishes the rank of Maj.

W. H. Marston (late Surg. Sub-Lt., R.N.V.R.), J. K. Steel, and H. W. Walter to be Lts.

INDIAN MEDICAL SERVICE.

Capts. to be Majs.: Bishambhar Sahai, Manohar Lal Bhargava, D. V. O'Malley, Tirath Ram Khanna, and S. Dutt.

Temp. Lts. to be Temp. Capts.: Ganeshrao Venkatrao Gollerkeri, and Bercut Narain Khan.

COLONIAL MEDICAL SERVICES.

Dr. H. G. Holdbrook, Medical Officer, Federated Malay States, to be Senior Medical Officer, Selangor; Dr. W. H. Hart, Medical Officer, Federated Malay States, to be Senior Medical Officer, Perak.

Dr. S. P. Joseph, Mr. M. Jinadasa, and Dr. A. A. M. Weeraperumall, medical officers, to be Provincial Surgeons, Ceylon.

The following appointments have been made: Capt. P. H. Martin, Pathologist to the Institute of Medical Research, Federated Malay States; Dr. G. E. M. B. Dodds and Dr. C. E. M. J. Libert, Medical Officers, West African Medical Staff; Miss G. Lowe, Medical Officer, Nigeria; Dr. G. M. M. Menzies and Dr. W. Hunter, Medical Officers, West African Medical Staff.

DONATIONS AND BEQUESTS.—As the result of the recent Westminster Hospital Week, which was organised by representatives of the principal firms in Westminster, the institution has received £3500.—Mr. William Lyon, Carnoustie, left £500 each to the Dundee Royal Infirmary and the Forfar Infirmary to be applied to name a bed after him.—Mr. John Norman Dickinson, of Cockermouth, Cumberland, left £500 each to the Whitehaven and West Cumberland Infirmary and the Cumberland Infirmary, Carlisle, and £200 to St. Dunstan's Hostel for the Blind.—Mr. John Denniston Wilson, of Shaftesbury-avenue, London, and formerly of the Mercantile Bank of India, Batavia, Java, who left £57,188, after a number of private and other bequests amounting to £20,000, gave £1000 to the Hospital for Sick Children, Great Ormond-street, London, and the residue of the property to the executors for charities and hospitals.—Miss Alice Isabella Avery, of Athelney, Torquay, besides other bequests, left over £7000 to charities, including £1000 each to the Edinburgh Medical Missionary Society and the Children's Emigration Homes, and £500 to the Birmingham Medical Mission.—The Manchester Board of Guardians have decided to contribute £1000 towards cancer research.—Mr. Edward Palgrave Simpson, of Durham Villas, Phillimore-gardens, London, left, among other bequests, £2000 to St. Dunstan's Hostel for the Blind; £1200 to the Jenny Lind Infirmary, Norwich: £1000 each to Dr. Barnardo's Homes and the National Lifeboat Institution; £500 each to the West London Hospital, the National Industrial Home for Cripple Boys, Kensington, the Royal Hospital for Incurables, Putney, S.W., the Kensington District Nursing Association, the Church of England Homes for Waifs and Strays; £250 each to the Children's Country Holiday Fund, the Girls' Friendly Society, and the Holiday Cottage, Aston Clinton; £200 to the Norfolk and Norwich Hospital; £100 each to the After-Care Association, the Institution for the Indigent Blind, Norwich, the Eye Infirmary, Norwich, the Children's Convalescent Home, Lowestoft, and to the National Benevolent Institution.—Mr. Arthur Frederic Pope, of Manchester, among other bequests, left £500 to the Northern Counties Hospital for Incurables, £500 to the Manchester and Salford Hospital for Skin Diseases, and £500 to the Manchester Royal Infirmary.

Correspondence.

"Audi alteram partem."

SMOOTH AND ROUGH VARIANTS OF BACTERIA.

To the Editor of THE LANCET.

SIR,—The letter by Surgeon-Commander Sheldon F. Dudley in THE LANCET of August 4th emphasises the present difficulties in attempting to analyse and classify the observed variation in bacteria. Names such as "smooth" and "rough" given to special instances of variation in the intestinal group have perhaps rather rashly been transferred to superficially similar variants in other groups. Morphological studies of colonies by Baerthlein and others, though of great importance in establishing that such variations do occur, do not of themselves lead very far on account of the great variety of the colonies, the uncertainty of the criteria based on colony morphology alone and the gradations between different types of colony.

It was in the hope of advancing the study of variation further along the path indicated by Baerthlein that the present writer described a particular kind of variant distinguished by three somewhat diverse characters—namely, irregularity of the edge and surface of the colony, agglutinability in salt solution, and alteration in the agglutination by serum. Though this group of characters which constituted the variant called "rough" in *Bacillus dysenteriæ*, *B. typhosus* and allied bacteria appears to represent a fundamentally changed race, still the change is not always complete and the three characters may to some extent vary independently. This also applies to a fourth character—absence of pathogenicity—which has since been determined in certain "rough" variants. The independent variability of the characters is perhaps often not so much due to the want of uniformity in the elementary factors in a given variant as to the observed characters not being sufficiently elementary to correspond exactly to the fundamental factors. Further observation and scrutiny tends to reveal the really essential units which themselves are concerned in variation.

As an example of diverse variants which are superficially alike may be mentioned the "medusa-head" colonies in *B. anthracis*, *B. subtilis*, streptococcus, and occasionally in *B. typhosus*. The appearance of this form of colony is due to growth of the bacteria in long chains or threads often without any other constantly associated change in the antigenic or other characters. Such colonies are probably in part responsible, as has recently been remarked by F. W. Andrewes, for the different observations as regards virulence, &c., obtained with colonies which appear alike. On account of the irregularity of surface "medusa-head" colonies have sometimes been called "rough" and a resemblance in virulence, antigenic properties, &c., to other "rough"-looking colonies, which are essentially very different, is expected unwarrantably. It is surely undesirable to decry the quest for "laws" or "rules" in variation because apparent exceptions occur, considering the complicated biological processes involved.

The promised publication by Commanders Dudley and Parker on the toxigenicity of different colony forms of *Corynebacterium diphtheriæ* will be welcomed by other bacteriologists, especially if it is possible to identify the forms which they have found with the two well-known colony variants formerly described by Cobbett and by Sclawyk and Manacatide, who did not find any change in virulence in their variants, or with the "non-virulent" variant with a special colony form recently obtained by M. Cowan Maitland from several virulent strains. In these researches the authors procured the variants pari passu with the more normal forms from virulent cultures.

in 1926. The Board of Health considered that the increased number was a sign of increased efficiency in the inspectorate, and if that was so, he was glad, but it also showed that there was still a substantial amount of tuberculosis among cattle in Scotland. In view of the danger to young children, especially the poorest, it was well that effective steps should be taken to deal with the matter. Even the Empire Marketing Board were now publishing placards inviting people to use more milk, but in view of the fact that the former percentage of tuberculous milk was 8 per cent., he would hesitate to recommend anyone with young children to use ordinary milk unless he was satisfied—which he was not—that that percentage had been reduced almost to vanishing point. It would be a good thing if the right hon. gentleman could reassure the public mind as to the quality of the milk, in view of the propaganda that was being carried on for increased consumption. The report contained a chapter on venereal disease. What was the position of the department in regard to that subject? The chapter in the report was very cautiously written, but it showed that the technical heads of the department were not at all satisfied with the position. The large sum of £60,000 or £70,000 was being spent in Scotland alone in dealing with this disease, and something like £600,000 throughout the Kingdom. Yet in Scotland the percentage of defaulters was 51. That showed an appalling waste of public money. The local authorities in Scotland were of opinion that the present arrangements were not satisfactory or efficient.

Coöperation Between Hospitals.

The question of coöperation between hospitals was being very carefully considered by many bodies, both in England and Scotland. The voluntary hospital managers were very much concerned at the present position, and the question of coöperation between the voluntary, municipal, and poor-law hospitals was bound to arise in connexion with the proposed local government changes. In Aberdeen there was an arrangement that seemed to be very desirable. The parish councils there had handed their hospitals over to the Public Health Committee of the town council, and the whole of the public health accommodation there was being administered by one authority. In Glasgow, also, there was a working arrangement of a similar kind. Many of the poor-law hospitals in Scotland were not well equipped or adequately staffed, and the association, with the municipal services, and with the staffs of the various voluntary hospitals, was bound to improve their efficiency. He was glad that the Department seemed inclined to encourage that. He would like to ask if the Secretary for Scotland had any information to give in regard to Craigleith Hospital. The position of that institution and Craiglockhart Hospital, he understood, was being considered and, in view of the shortage of beds in Edinburgh Infirmary, it would be as well if some arrangement of that kind were made as soon as possible. The report of the Mackenzie Committee stated that there was a shortage of 3000 beds in Scotland two years ago, and the position was not any better to-day. Did the Minister consider that adequate arrangements had now been made, or were likely to be made, to provide at an early date a proper number of beds? The Scottish Committee of the British Hospitals Association had set up five local committees for coördinating the various hospital activities, and there was also a liaison committee between those bodies and the Department. Why were there no representatives of the municipalities on that liaison committee? This ought not to be a matter purely between the managers of voluntary hospitals and the Department: the municipal medical services ought to be represented in any working arrangement of this kind, because there was in these negotiations a danger of magnifying to too great an extent the importance of the voluntary principle and to say that it must be preserved at all costs. The first consideration must be the efficiency of the hospital service and the supply of an adequate number of beds. While they acknowledged the important work which the voluntary hospitals had done, they regarded the voluntary agent as being the pioneer, and considered that when the necessity of the work was evident it should be done by the public authority, so that adequate medical attention might be given to all classes of the community.

What had happened to the report of the Departmental Committee on Maternal Mortality which was issued about 18 months ago? How many of its recommendations had been put into operation? There was no doubt that this subject must ultimately be dealt with by municipal maternity services, and by ensuring coöperation between doctors and midwives, and between the ante-natal services and the other public health services. He could not now go into the large question of the nutrition of school-children, but he called attention to the fact that last year 6·4 per cent. of school-children in Scotland were in a state of nutrition below the average, while 1·5 per 1000 were in a state of very poor nutrition. Was the Board of Health urging local authorities to put into operation the whole of their powers for feeding necessitous children? With all the poverty and misfortune in Scotland there was money enough to feed the children. The same consideration applied to the questions of the dental treatment of school children and treatment of adenoids, tonsils, and so on. There was no doubt that many of these children were suffering in health because of defects which, if their parents were in a better position in society and had more money, would be remedied as a matter of course: but because the parents were unable to afford it, and because the school medical service was not big enough and had not sufficient resources, they were left to drift very often into a state of chronic ill-health.

Mr. MACQUISTEN attributed the poverty of some districts of Southern Scotland to Irish incursion.

Mr. JAMES STEWART drew attention to the alarming figures in the report with reference to tuberculosis, both case-rate and death-rate being on the ascendant, especially in the Highlands and Islands.

Mr. T. HENDERSON called attention to the inadequacy of the efforts to suppress venereal disease in Scotland.

Reply to the Debate.

Major ELLIOT (Under-Secretary of State for Scotland) in replying to the debate, said that the Board of Health were keeping an anxious watch on the health of Scotland to see if deterioration was taking place—that deterioration which indeed one would expect from the long-continued industrial depression. They had not yet any evidence to lead to the conclusion that deterioration was taking place. The reports of medical officers of health on the school population did not indicate any deterioration in the health of the children of Scotland generally. They had kept a watchful eye on the vital statistics of the country. It was true that last year the pulmonary tuberculosis figures were higher than those of the year before, but they were lower than they had been for any year up to that time, lower than in 1921, 1922, 1923, 1924, and 1925. Non-pulmonary tuberculosis continued to fall and was lower last year than ever before. They all agreed as to the tremendous struggle through which industrial Scotland was passing and the Government were not blind to the situation. They recognised the urgent necessity to deal with it by legislation which would be laid before the House before the end of the present year. Dr. Shiels had said that the percentage of underfed and badly-fed children was too high and he (Major Elliot) agreed with him. They must continue to do their utmost by improving the school medical services and by tightening up regulations to make sure that the Education Act was carried out and that every child got sufficient nourishment to enable it to take advantage of education. There was no divergence of opinion between the Secretary of State and his advisers on the question of venereal disease. The report made it quite clear that in the opinion of the Secretary of State the time had not come to ask the House for further compulsory powers until they were sure that the powers already entrusted to the local authorities by the Government had been utilised *to the full.*

Dr. SHIELS said that the point he wished to make was that there was a divergence of opinion between the Scottish Board of Health and the English Ministry of Health and not between the Secretary for Scotland and his advisers.

Major ELLIOT said he could assure the hon. gentleman that the Secretary for Scotland was in no way inclined to defer to the opinion of the English Minister. He considered the matter on its merits in consultation with his technical advisers and in accordance with their advice he came to the conclusion mentioned in the report. The Scottish Board of Health were not flinching from drastic action to make sure that the milk-supplies were as pure as could reasonably be managed. In reply to Dr. Shiels's question as to the medical member of the Board of Health, everyone knew that Sir Leslie Mackenzie had now retired, and it was right that Parliament should take note of that fact and remember, with gratitude, the great work that he had done for the health of the people of Scotland—(general cheers)—during the many years that he had been entrusted with that duty. The reason that a new medical member had not yet been appointed to take his place was simply that the Bill for the Reorganisation of Offices in Scotland had not yet received the Royal Assent. As soon as that Bill became an Act of Parliament the Secretary for Scotland would proceed with the utmost expedition to make the new appointment. He had nothing further to report for the moment in regard to hospitals, but the proposals that Dr. Shiels had brought forward would be considered. He was not able to say that the shortage of hospital beds had been remedied, but an improvement was being effected almost monthly, with the provision of increased

society with these aims and I shall be pleased to hear from any would-be supporters.

I am, Sir, yours faithfully,

Harley-street, W., July 24th, 1928. ESTELLE COLE.

*** Dr. Cole raises a very important point, but our reviewer has not exactly approved the absence of teaching in psychopathology so much as conveyed the opinion that so important and difficult a subject should be properly taught or left alone. We have seen instructions in manuals of psychiatry which could have but little relation to the counsels which would be given by lectures to students out of first-hand experience.—ED. L.

CANCER AND THE BLOOD-GROUPS.

To the Editor of THE LANCET.

SIR,—In general practice there are occasions in which cancer appears to be a family disease, and on the other hand, some family strains appear to be immune. If not already dealt with and known, an investigation of the relative incidence of cancer in the different blood-groups might prove interesting.

I am, Sir, yours faithfully,

PENROSE WILLIAMS, F.R.C.S. Edin.

Cornwall, August 6th, 1928.

HOME PRODUCTION OF COCAINE.

To the Editor of THE LANCET.

SIR,—In an annotation entitled The Traffic in Narcotic Drugs, which appeared in your last issue (p. 236), you refer to the manufacture of cocaine in this country and state that hitherto there has been no production of cocaine from the leaves, or by refining crude cocaine, in Great Britain, adding that in 1927 a licence was granted to a firm of manufacturing chemists to carry on experiments in such manufacture. You will be interested to learn that cocaine was manufactured by us in 1903 at the Wellcome Chemical Works, Dartford. We were granted a Home Office licence in March, 1917, and have manufactured many thousands of ounces of cocaine at Dartford.

We are, Sir, yours faithfully,

BURROUGHS WELLCOME AND CO.

Snow-hill-buildings, London, E.C.,
August 8th, 1928.

SMOKE ABATEMENT INQUIRY AT BRADFORD.—Mr. F. O. Sandford, of the Ministry of Health, recently conducted an inquiry at Bradford into the application by various West Riding authorities for new by-laws on the smoke nuisance. The proposed by-laws provide that the emission of black smoke for two minutes in the aggregate within any continuous period of 30 minutes should constitute a nuisance. The authorities applying for the by-laws were Bradford, Huddersfield, Leeds, Halifax, Dewsbury, Batley, Spenborough, and Guiseley. In support of the application it was stated that the decision to apply for new by-laws arose out of a recommendation by a regional smoke abatement committee for the West Riding of Yorkshire, which represented something like 100 local authorities and a million people, and that committee approved of the terms of the suggested by-laws. In Bradford alone there were 438 industrial chimneys and 1330 furnaces. During the last seven years there had been 73 proved cases of smoke offences, and one firm had been prosecuted 70 times. The standard adopted in regard to smoke nuisance varied widely in the districts concerned. Amongst others evidence in support of the application was given by the medical officers of Bradford and Leeds. In opposition to the proposed by-laws by various trade associations and chambers of commerce it was stated that it had been proved by experience by firms with the most modern plant that it was impossible to comply with the terms of the by-laws. It could not be worked in practice, except by imposing a tremendous burden on industry. It was contended that the existing local Acts in Bradford were quite sufficient to deal with the problem.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

PROROGATION OF PARLIAMENT.

PARLIAMENT was prorogued on Friday, August 3rd, until Tuesday, Nov. 6th. The Royal Assent was given by Royal Commission to a large number of Acts passed during the past session.

HEALTH ADMINISTRATION IN SCOTLAND.

On Tuesday, July 31st, the House of Commons went into Committee of Supply on a vote of £2,037,515 for the salaries and expenses of the Scottish Board of Health. Mr. JAMES HOPE was in the chair.

Mr. W. ADAMSON said the subject he wished to raise was the deterioration of the physical condition of the Scottish people due to the inadequate provision that was being made for them by the Scottish Board of Health. There were a number of causes that were leading to the poverty-stricken conditions in which a large number of Scottish people found themselves to-day, but the main cause was unemployment. That problem was even more severe in Scotland than it was in England. Nearly one-third fewer miners were being employed to-day than were at work in 1924. In many cases the unemployed persons had been out of work for a considerable time. In Glasgow the period of unemployment ranged from six months to six years. This problem was bearing very heavily upon the local authorities in Scotland, and particularly upon the parish councils. He wished to impress upon the Secretary for Scotland that the provisions made in these estimates to deal with the problem of poverty and distress in Scotland were quite inadequate. In last year's estimates they had £260,000 in grants made to parish councils in respect of poor relief, but this year there was not a single penny. He appealed to the Secretary for Scotland to examine this problem closely with a view to more being done by the Scottish Board of Health to enable Scotland to shoulder this grievous burden.

Dr. DRUMMOND SHIELS said that that was the last time they would discuss the report as the report of the Scottish Board of Health. In the valedictory foreword which the members of the Board had inserted in the report they expressed the belief that the efficiency of the work of the department in future would not be inferior in any way to that of the Board. Although Labour Members had strongly opposed the change that was to be made they sincerely wished that the high standard of efficiency associated with the Board of Health would be maintained under the new régime. He wished to know what was the position with regard to the vacancy in the medical membership of the Board. It was known for a long while in advance that Sir Leslie Mackenzie was going to resign. Could the Secretary for Scotland now intimate who his successor would be? He sincerely hoped that when the appointment was made it would be found that a member of the present staff had been promoted to the position.

Milk-supply and Tuberculosis.

The question of the milk-supply and tuberculosis was, he said, dealt with in the report. Undoubtedly under the effective administration of Dr. Leighton a very great improvement had taken place in the milk-supply of Scotland. It was much cleaner and better than it had ever been. There had been a gratifying increase in the quantity of licensed graded milk, but it still amounted to little more than 1 per cent. of the whole milk used in Scotland. The nomenclature of the grades was very misleading. There was no doubt that Grade A in bulk, which was only the third of the qualities, was considered by many people to be the first quality, while the tuberculin-tested milk had not got its proper position in the public mind because of confusion of Grade A milk with that of the highest quality. Some revision of that nomenclature ought to be made, so that the public could understand properly what the position was. He would like to know if the Secretary for Scotland was satisfied with regard to pasteurised milk? If pasteurisation was carried out effectively this milk was safe, but there was a great liability for pasteurisation to be done ineffectively, and to be a danger rather than a help by misleading people as to its safety. The report did not deal with the point. Was any definite standard laid down; if so, was it being enforced; and had there been any cases where pasteurisation, which was becoming almost the most popular form of protecting milk, was regarded by the Department as being wholly safe and to be trusted?

The report stated that last year 2240 animals, mostly cows, were condemned as tuberculous, compared with 1852

in 1926. The Board of Health considered that the increased number was a sign of increased efficiency in the inspectorate, and if that was so, he was glad, but it also showed that there was still a substantial amount of tuberculosis among cattle in Scotland. In view of the danger to young children, especially the poorest, it was well that effective steps should be taken to deal with the matter. Even the Empire Marketing Board were now publishing placards inviting people to use more milk, but in view of the fact that the former percentage of tuberculous milk was 8 per cent., he would hesitate to recommend anyone with young children to use ordinary milk unless he was satisfied—which he was not—that that percentage had been reduced almost to vanishing point. It would be a good thing if the right hon. gentleman could reassure the public mind as to the quality of the milk, in view of the propaganda that was being carried on for increased consumption. The report contained a chapter on venereal disease. What was the position of the department in regard to that subject? The chapter in the report was very cautiously written, but it showed that the technical heads of the department were not at all satisfied with the position. The large sum of £60,000 or £70,000 was being spent in Scotland alone in dealing with this disease, and something like £600,000 throughout the Kingdom. Yet in Scotland the percentage of defaulters was 51. That showed an appalling waste of public money. The local authorities in Scotland were of opinion that the present arrangements were not satisfactory or efficient.

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The question of coöperation between hospitals was being very carefully considered by many bodies, both in England and Scotland. The voluntary hospital managers were very much concerned at the present position, and the question of coöperation between the voluntary, municipal, and poor-law hospitals was bound to arise in connexion with the proposed local government changes. In Aberdeen there was an arrangement that seemed to be very desirable. The parish councils there had handed their hospitals over to the Public Health Committee of the town council, and the whole of the public health accommodation there was being administered by one authority. In Glasgow, also, there was a working arrangement of a similar kind. Many of the poor-law hospitals in Scotland were not well equipped or adequately staffed, and the association, with the municipal services, and with the staffs of the various voluntary hospitals, was bound to improve their efficiency. He was glad that the Department seemed inclined to encourage that. He would like to ask if the Secretary for Scotland had any information to give in regard to Craigleith Hospital. The position of that institution and Craiglockhart Hospital, he understood, was being considered and, in view of the shortage of beds in Edinburgh Infirmary, it would be as well if some arrangement of that kind were made as soon as possible. The report of the Mackenzie Committee stated that there was a shortage of 3600 beds in Scotland two years ago, and the position was not any better to-day. Did the Minister consider that adequate arrangements had now been made, or were likely to be made, to provide at an early date a proper number of beds? The Scottish Committee of the British Hospitals Association had set up five local committees for coördinating the various hospital activities, and there was also a liaison committee between those bodies and the Department. Why were there no representatives of the municipalities on that liaison committee? This ought not to be a matter purely between the managers of voluntary hospitals and the Department; the municipal medical services ought to be represented in any working arrangement of this kind, because there was in these negotiations a danger of magnifying to too great an extent the importance of the voluntary principle and to say that it must be preserved at all costs. The first consideration must be the efficiency of the hospital service and the supply of an adequate number of beds. While they acknowledged the important work which the voluntary hospitals had done, they regarded the voluntary agent as being the pioneer, and considered that when the necessity of the work was evident it should be done by the public authority, so that adequate medical attention might be given to all classes of the community.

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NOTES ON CURRENT TOPICS.

PROROGATION OF PARLIAMENT.

PARLIAMENT was prorogued on Friday, August 3rd, until Tuesday, Nov. 6th. The Royal Assent was given by Royal Commission to a large number of Acts passed during the past session.

HEALTH ADMINISTRATION IN SCOTLAND.

On Tuesday, July 31st, the House of Commons went into Committee of Supply on a vote of £2,037,515 for the salaries and expenses of the Scottish Board of Health. Mr. JAMES HOPE was in the chair.

Mr. W. ADAMSON said the subject he wished to raise was the deterioration of the physical condition of the Scottish people due to the inadequate provision that was being made for them by the Scottish Board of Health. There were a number of causes that were leading to the poverty-stricken conditions in which a large number of Scottish people found themselves to-day, but the main cause was unemployment. That problem was even more severe in Scotland than it was in England. Nearly one-third fewer miners were being employed to-day than were at work in 1924. In many cases the unemployed persons had been out of work for a considerable time. In Glasgow the period of unemployment ranged from six months to six years. This problem was bearing very heavily upon the local authorities in Scotland, and particularly upon the parish councils. He wished to impress upon the Secretary for Scotland that the provisions made in these estimates to deal with the problem of poverty and distress in Scotland were quite inadequate. In last year's estimates they had £260,000 in grants made to parish councils in respect of poor relief, but this year there was not a single penny. He appealed to the Secretary for Scotland to examine this problem closely with a view to more being done by the Scottish Board of Health to enable Scotland to shoulder this grievous burden.

Dr. DRUMMOND SHIELS said that that was the last time they would discuss the report as the report of the Scottish Board of Health. In the valedictory foreword which the members of the Board had inserted in the report they expressed the belief that the efficiency of the work of the department in future would not be inferior in any way to that of the Board. Although Labour Members had strongly opposed the change that was to be made they sincerely wished that the high standard of efficiency associated with the Board of Health would be maintained under the new régime. He wished to know what was the position with regard to the vacancy in the medical membership of the Board. It was known for a long while in advance that Sir Leslie Mackenzie was going to resign. Could the Secretary for Scotland now intimate who his successor would be? He sincerely hoped that when the appointment was made it would be found that a member of the present staff had been promoted to the position.

Milk-supply and Tuberculosis.

The question of the milk-supply and tuberculosis was, he said, dealt with in the report. Undoubtedly under the effective administration of Dr. Leighton a very great improvement had taken place in the milk-supply of Scotland. It was much cleaner and better than it had ever been. There had been a gratifying increase in the quantity of licensed graded milk, but it still amounted to little more than 1 per cent. of the whole milk used in Scotland. The nomenclature of the grades was very misleading. There was no doubt that Grade A in bulk, which was only the third of the qualities, was considered by many people to be the first quality, while the tuberculin-tested milk had not got its proper position in the public mind because of confusion of Grade A milk with that of the highest quality. Some revision of that nomenclature ought to be made, so that the public could understand properly what the position was. He would like to know if the Secretary for Scotland was satisfied with regard to pasteurised milk? If pasteurisation was carried out effectively this milk was safe, but there was a great liability for pasteurisation to be done ineffectively, and to be a danger rather than a help by misleading people as to its safety. The report did not deal with the point. Was any definite standard laid down; if so, was it being enforced; and had there been any cases where pasteurisation, which was becoming almost the most popular form of protecting milk, was regarded by the Department as being wholly safe and to be trusted?

The report stated that last year 2240 animals, mostly cows, were condemned as tuberculous, compared with 1852

in 1926. The Board of Health considered that the increased number was a sign of increased efficiency in the inspectorate, and if that was so, he was glad, but it also showed that there was still a substantial amount of tuberculosis among cattle in Scotland. In view of the danger to young children, especially the poorest, it was well that effective steps should be taken to deal with the matter. Even the Empire Marketing Board were now publishing placards inviting people to use more milk, but in view of the fact that the former percentage of tuberculous milk was 8 per cent., he would hesitate to recommend anyone with young children to use ordinary milk unless he was satisfied—which he was not—that that percentage had been reduced almost to vanishing point. It would be a good thing if the right hon. gentleman could reassure the public mind as to the quality of the milk, in view of the propaganda that was being carried on for increased consumption. The report contained a chapter on venereal disease. What was the position of the department in regard to that subject? The chapter in the report was very cautiously written, but it showed that the technical heads of the department were not at all satisfied with the position. The large sum of £60,000 or £70,000 was being spent in Scotland alone in dealing with this disease, and something like £600,000 throughout the Kingdom. Yet in Scotland the percentage of defaulters was 51. That showed an appalling waste of public money. The local authorities in Scotland were of opinion that the present arrangements were not satisfactory or efficient.

Coöperation Between Hospitals.

The question of coöperation between hospitals was being very carefully considered by many bodies, both in England and Scotland. The voluntary hospital managers were very much concerned at the present position, and the question of coöperation between the voluntary, municipal, and poor-law hospitals was bound to arise in connexion with the proposed local government changes. In Aberdeen there was an arrangement that seemed to be very desirable. The parish councils there had handed their hospitals over to the Public Health Committee of the town council, and the whole of the public health accommodation there was being administered by one authority. In Glasgow, also, there was a working arrangement of a similar kind. Many of the poor-law hospitals in Scotland were not well equipped or adequately staffed, and the association, with the municipal services, and with the staffs of the various voluntary hospitals, was bound to improve their efficiency. He was glad that the Department seemed inclined to encourage that. He would like to ask if the Secretary for Scotland had any information to give in regard to Craigleith Hospital. The position of that institution and Craiglockhart Hospital, he understood, was being considered and, in view of the shortage of beds in Edinburgh Infirmary, it would be as well if some arrangement of that kind were made as soon as possible. The report of the Mackenzie Committee stated that there was a shortage of 3600 beds in Scotland two years ago, and the position was not any better to-day. Did the Minister consider that adequate arrangements had now been made, or were likely to be made, to provide at an early date a proper number of beds? The Scottish Committee of the British Hospitals Association had set up five local committees for coördinating the various hospital activities, and there was also a liaison committee between those bodies and the Department. Why were there no representatives of the municipalities on that liaison committee? This ought not to be a matter purely between the managers of voluntary hospitals and the Department: the municipal medical services ought to be represented in any working arrangement of this kind, because there was in these negotiations a danger of magnifying to too great an extent the importance of the voluntary principle and to say that it must be preserved at all costs. The first consideration must be the efficiency of the hospital service and the supply of an adequate number of beds. While they acknowledged the important work which the voluntary hospitals had done, they regarded the voluntary agent as being the pioneer, and considered that when the necessity of the work was evident it should be done by the public authority, so that adequate medical attention might be given to all classes of the community.

What had happened to the report of the Departmental Committee on Maternal Mortality which was issued about 18 months ago? How many of its recommendations had been put into operation? There was no doubt that this subject must ultimately be dealt with by municipal maternity services, and by ensuring coöperation between doctors and midwives, and between the ante-natal services and the other public health services. He could not now go into the large question of the nutrition of school-children, but he called attention to the fact that last year 6·4 per cent. of school-children in Scotland were in a state of nutrition below the average, while 1·5 per 1000 were in a state of very poor nutrition. Was the Board of Health urging local authorities to put into operation the whole of their powers for feeding necessitous children? With all the poverty and misfortune in Scotland there was money enough to feed the children. The same consideration applied to the questions of the dental treatment of school children and treatment of adenoids, tonsils, and so on. There was no doubt that many of these children were suffering in health because of defects which, if their parents were in a better position in society and had more money, would be remedied as a matter of course; but because the parents were unable to afford it, and because the school medical service was not big enough and had not sufficient resources, they were left to drift very often into a state of chronic ill-health.

Mr. MACQUISTEN attributed the poverty of some districts of Southern Scotland to Irish incursion.

Mr. JAMES STEWART drew attention to the alarming figures in the report with reference to tuberculosis, both case-rate and death-rate being on the ascendant, especially in the Highlands and Islands.

Mr. T. HENDERSON called attention to the inadequacy of the efforts to suppress venereal disease in Scotland.

Reply to the Debate.

Major ELLIOT (Under-Secretary of State for Scotland) in replying to the debate, said that the Board of Health were keeping an anxious watch on the health of Scotland to see if deterioration was taking place—that deterioration which indeed one would expect from the long-continued industrial depression. They had not yet any evidence to lead to the conclusion that deterioration was taking place. The reports of medical officers of health on the school population did not indicate any deterioration in the health of the children of Scotland generally. They had kept a watchful eye on the vital statistics of the country. It was true that last year the pulmonary tuberculosis figures were higher than those of the year before, but they were lower than they had been for any year up to that time, lower than in 1921, 1922, 1923, 1924, and 1925. Non-pulmonary tuberculosis continued to fall and was lower last year than ever before. They all agreed as to the tremendous struggle through which industrial Scotland was passing and the Government were not blind to the situation. They recognised the urgent necessity to deal with it by legislation which would be laid before the House before the end of the present year. Dr. Shiels had said that the percentage of underfed and badly-fed children was too high and he (Major Elliot) agreed with him. They must continue to do their utmost by improving the school medical services and by tightening up regulations to make sure that the Education Act was carried out and that every child got sufficient nourishment to enable it to take advantage of education. There was no divergence of opinion between the Secretary of State and his advisers on the question of venereal disease. The report made it quite clear that in the opinion of the Secretary of State the time had not come to ask the House for further compulsory powers until they were sure that the powers already entrusted to the local authorities by the Government had been utilised to the full.

Dr. SHIELS said that the point he wished to make was that there was a divergence of opinion between the Scottish Board of Health and the English Ministry of Health and not between the Secretary for Scotland and his advisers.

Major ELLIOT said he could assure the hon. gentleman that the Secretary for Scotland was in no way inclined to defer to the opinion of the English Minister. He considered the matter on its merits in consultation with his technical advisers and in accordance with their advice he came to the conclusion mentioned in the report. The Scottish Board of Health were not flinching from drastic action to make sure that the milk-supplies were as pure as could reasonably be managed. In reply to Dr. Shiels's question as to the medical member of the Board of Health, everyone knew that Sir Leslie Mackenzie had now retired, and it was right that Parliament should take note of that fact and remember, with gratitude, the great work that he had done for the health of the people of Scotland—(general cheers)—during the many years that he had been entrusted with that duty. The reason that a new medical member had not yet been appointed to take his place was simply that the Bill for the Reorganisation of Offices in Scotland had not yet received the Royal Assent. As soon as that Bill became an Act of Parliament the Secretary for Scotland would proceed with the utmost expedition to make the new appointment. He had nothing further to report for the moment in regard to hospitals, but the proposals that Dr. Shiels had brought forward would be considered. He was not able to say that the shortage of hospital beds had been remedied, but an improvement was being effected almost monthly, with the provision of increased

hospital accommodation for the sick people of Scotland. Only a few weeks ago he had opened the new Northern Infirmary at Inverness where considerably increased medical facilities had been made available for the people in the northern districts. With regard to the report of the Departmental Committee on Maternal Mortality, the Board had done their utmost to bring up to date the system in Scotland in regard to the services for pregnant women. The Maternity Homes Act ensured that there was now a service available for 100 per cent. of the mothers of Scotland, a thing that could be said of very few other countries in the world. The Board had not succeeded in reducing the very high percentage of deaths from puerperal fever, but they were considering fresh steps for dealing with that matter. The service had been made available, however, and they would do their utmost, by administrative action, to secure that further institutional accommodation was made available for women in childbirth. In regard to tuberculosis there were fluctuations from year to year, but what they had to observe was the general trend of the figures and that gave them no reason to despair or to feel that any serious inroads were being made on the health of the people of Scotland. As regarded tuberculosis in the Island of Lewis they had done their utmost to deal with that matter. Sanatoria had been opened and there were three whole-time men and three medical officers of health and assistants working part time on that problem. It might be that they were dealing there with a hereditary resistance which was lower than the resistance on the mainland, or in those parts of the country which had been longer exposed to the infection of the disease. They were, however, at present engaged in investigations to see whether that was the case or not. The nine years during which the Scottish Board of Health had presided over public health matters in Scotland had been years of varying fortunes, but as regarded health, housing, and social conditions they showed a distinct improvement. If they could make as much progress in the next nine years he would be satisfied.

Mr. **Johnston** asked if the Under-Secretary could make some statement with reference to the practice carried on for some considerable time by one firm of importing inedible grease by the shipload from abroad and selling it to poor people as edible lard?

Major **Elliot** said that the Government took a serious and grave view of this matter. They felt that a definite offence had been going on. The local authorities upon whom the onus of prosecution fell had now the matter under consideration. The Government would not stand in the way of steps being taken, if they desired to take steps. The stock now under embargo in Glasgow would be dealt with as the order of the Court decided.

The vote was agreed to.

Ministry of Health Vote.

On Wednesday, August 1st, the House considered the Report of a vote of £13,774,025 for the salaries and expenses of the Ministry of Health.

Mr. **Lansbury** protested against the reduction which he said the Minister of Health was making in the grants for milk distribution, housing, and slum clearance, and poor-law relief.

Lieut.-Colonel **Fremantle** said that there had been presented to Parliament in the last two days a report from the Departmental Committee on Vaccination, which could not be taken into account so late in the session, but which must be referred to. Having enumerated the circumstances which led to the appointment of the Committee—certain objections to the practice of vaccination and certain doubts with regard to the necessity of its continuation on the present lines owing to the milder type of small-pox—he called attention to the danger represented by the large number of unvaccinated people which was increasing every year in proportion to the whole population, a circumstance which had an international aspect, because other countries held that vaccination was a very small price to pay for protection from a very alarming disease. Therefore action was required to be taken, and in the first instance a scientific committee was appointed to inquire into the nature of vaccination and into the various conditions which appertained to the operation of vaccination. That committee had presented a lengthy report which, from a scientific point of view, did great credit to its authors, and left the legislators very much in the same position as they were in originally from a practical point of view, for it showed that the position required further investigation on scientific lines.

Vaccination and Nervous Disorder.

There was one point which the report raised—it had been made a serious problem in the Press as well as in the House of Commons—and that was the occurrence in the period after vaccination of certain unfortunate cases of nervous disorder which had been stated by some hastily, and by others anxiously, as being possibly due to the operation of vaccination. This report dealt with those cases very thoroughly. They had to treat these exceptions in their proper light and proportion; and the report showed that they were a small number compared with the total number of vaccinations. The total number of cases with which the Committee dealt was 62, of which, unfortunately, a considerable number were fatal. They must recognise the seriousness of these facts; but when they were dealing with 314,000 primary vaccinations in one year 62 in all was a small number and they must not exaggerate its significance. The total number of deaths from vaccinia over a period of 15 years had only been 0·001 per 100 vaccinations. Still, these were facts which have to be faced and they who were such keen supporters of vaccination as essential to the community would be misleading the House if they did not face them. The report showed first of all that it was a curious thing that in the year 1924 the Committee could trace no cases whatever, although they searched most diligently through all the records of the results of vaccination, and those records were very complete. The Committee found some of these cases in 1922 and 1923. They found a close association between these cases and the epidemics of disease known as encephalitis lethargica and poliomyelitis. The conclusion that the Committee came to was that just as children suffering from scarlet fever, measles, and other ordinary ailments were more susceptible in a time of outbreak to poliomyelitis, so similarly those who had been vaccinated were liable to be attacked by these passing diseases in a time of epidemic. The Committee pointed out exactly the limits within which further observation was required, the points to which their sense of anxiety must be directed, and the directions in which in future they hoped to be able to find out exactly the nature of the trouble which had caused this symptom, which was entirely accidental both geographically—for it had occurred in Holland as well as in this country—and in years, and they might hope that they would not see them occur again.

The speaker looked forward to the improvement in vaccination administration that would follow its transference to the sanitary authorities, and deplored the conduct of those who, in defiance of the facts, tried to terrorise people on lines which every man who was sensible believed were scandalous exaggeration and malicious inventions.

Ministry of Health Estimates.

He would like to look shortly at the total estimates of the Ministry of Health. The total estimate for this year was £20,000,000, showing an increase of nearly £1,000,000 on last year, for excellent reasons. Of the £20,000,000 over half was due to housing, so that the public health side was under £10,000,000. The prevention of disease which was preventable had resulted, and was resulting, in an enormous improvement in the health and efficiency of the people as well as in their general habits. But the estimates for the Defence Forces amounted to £114,000,000. The real moral of the contrast between that large sum and the £10,000,000 spent on the prevention and cure of disease was that when there was a clear case made out for extra expenditure for the Ministry of Health there should be no question raised about it. If they could get general agreement on this on very side of the House he would suggest to those who, like himself, were keen on the prevention of disease and on improving the lot of suffering humanity, that they should be very careful what they supported and careful to avoid waste. There had been cases again and again where extra money has been asked really as an extra dole and not for the prevention of disease. They desired further provision to be made for the clearance of the slums. They must focus attention in the provision of housing for the very poor, and in order to do that it would be the duty of the State before long to remove the subsidy from the upper grades of houses, because the people who lived in those houses could look after themselves now.

Housing and Health Services.

Mr. **Harris** said the money which had been spent on housing and health services was most important, and it was more impressive when they remembered the immense improvement in public health during the last 15 or 20 years, largely due to schemes undertaken for that purpose. The various schemes which were initiated by the Government before the war had borne excellent fruit, and had justified the expenditure. In some boroughs, even in very crowded areas, the system of maternity and child welfare had had a remarkable effect on the death-rate. For instance, in Bethnal Green, the poorest neighbourhood in the whole of London, and the most overcrowded, they had reduced the infantile mortality to 57·7 per 1000. In that respect they had been able to take the prize for the best result in London. That figure compared with 59 per 1000 for London as a whole, and 69 per 1000 for England and Wales, including the rural and well-to-do districts. Their infant death-rate had shown a steady decline. In 1916 it was 106 per 1000. In 1918 129 per 1000. It then came down to 90 in 1922; next to 71, and this year it was 57. That reflected very great credit on the medical officer and the loyal servants who worked with him. It was not unreasonable to say that this improvement was largely due to the distribution of free milk. There had never been a better expenditure of public money than the giving away of milk through the health departments of the local authorities. In Bethnal Green milk was given to expectant mothers three months before confinement, to nursing mothers, and to children up to 3 years. One pint per day was given, and that was not enough to demoralise any woman or any child. Except for children between 3 months and 18 months no larger quantity was given; it was then at the maximum of 1½ pints, and in that case a medical certificate was required. He could not make out why the Minister of Health had singled out this expenditure on milk for his special veto. He now said that milk should not be given away to mothers or their children who were in receipt of poor-law relief, directly or indirectly. He required a special medical certificate before even a pint of milk could be obtained. That was most unfortunate. It might be said why should not these people buy the milk themselves? Unfortunately milk was not a popular diet; and they had to do a great deal of education in that direction. The Empire Marketing Board was spending thousands of pounds in putting up posters urging people to drink more milk. Not only was the distribution of milk valuable from an educational point of view, but it was most important at this very sensitive stage of a child's life.

Tuberculosis.

The complex problem of tuberculosis had racked the mind of every Minister of Health and of every local authority. The medical officer of health in Bethnal Green had given great attention to the subject. In connexion with the death-rate from tuberculosis a very serious phase had been pointed out to him. There had been a very heavy and rapid mortality among patients who had died within a year of notification. In 1917 the percentage of patients dying within a year of notification in Bethnal Green was 21·9, and in 1922 the percentage was 26·9. They had taken the trouble to follow up the cases. The reason for this alarming death-rate had been given to him by their very able medical officer as due to the diffidence among patients in informing the authorities that they were suffering from the disease. A conference of local authorities in London had pointed to the great success of the experiment at Papworth, where industrial training was correlated with treatment. The Minister of Health might well spend a little time inquiring into that matter, and take steps to encourage those suffering from the disease to notify the authorities earlier. All these health questions were, however, connected with the housing problem. One of the difficulties in dealing with tuberculosis was that when a man returned nearly cured, he had to go back to a two- or three-roomed tenement, and share the house with a family of five or six children. He was not going to underrate what the Ministry of Health or the local authorities had done, but there was a little danger in the optimism which said that most of the lee-way had now been made up. Whatever the Minister might do in the way of reducing the subsidy on the more expensive houses, he must on no account consider for a moment reducing the subsidy on houses which were wanted to meet the real and urgent need of the working classes.

Captain BOURNE said that there were on the registers of local authorities some 363,000 people suffering from tuberculosis, and of that number some 63,000 were treated in any one year in sanatoria. The average stay of a man in a sanatorium was some 150 days, and the cost per patient was 49*s.* 3½*d.* per week. That meant that the total cost of sanatoria treatment was between £4,000,000 and £5,000,000 per annum. If it were certain that that sum would really effect the cure of tuberculosis, he did not think anyone would grudge the money, but the Minister, when he was asked if he had statistics to show how many of the people who passed through sanatoria were cured had to admit that he had no reliable information on that subject. There had been in his constituency recently an effort to deal with some of these cases by means of the tuberculin treatment. While that method had been reported upon unfavourably, it had nevertheless been tried in some localities with very beneficial results. The tuberculin treatment had one advantage. It did not require isolation in a sanatorium, and a man who was undergoing it could go about his ordinary occupation. It was a very much cheaper form of treatment than sanatorium treatment, and although he spoke with great diffidence as a layman, he felt that anything which might possibly be helpful to people suffering from this disease ought to be investigated by the Ministry.

Mr. BRIANT raised the question of the conditions in the hop districts. He said that having seen these conditions for himself, and having studied the reports of the medical officers dealing with them, he did not hesitate to say that in a large part of these areas the conditions were absolutely disgusting and unfit for any human being.

Colonel APPLIN asked if the Committee on Maternal Mortality had reported, and if so, what was the nature of the report? Were they going on in the same old way allowing mothers to die when their lives might be saved? When the Committee had reported would the Minister consider giving the same information to the poor women as was given by private doctors to those who were better off? As long as that information was withheld, they would have this great mortality among mothers, and go on rearing a generation of young people unfit to come into the world by reason of their mothers being unfit to bear them.

The Welsh Board of Health.

Mr. JOHN protested against the Minister's action in reorganising the Welsh Board of Health. Under the new scheme he said they were to have no Board of Health in Wales, but instead they were to have three officers in Cardiff carrying out the work of civil servants under the direct instructions of Whitehall, with no provision whatever for joint action under a duly appointed chairman.

Mr. LLOYD GEORGE said he very much regretted that it should have been necessary to raise this question at all in the House. He had hoped after the representations made to the Minister, not merely by his political opponents but by the whole of his political friends in Wales, that he would have made this concession to the unanimous wish of the Welsh people without distinction of party or creed. He urged the Minister of Health to reconsider this matter.

The Minister's Reply.

Mr. CHAMBERLAIN (Minister of Health) said the Welsh Board of Health had never been a board in the ordinary sense of the word, because a board in the ordinary sense was an executive body, and the Welsh Board of Health had never been an executive body since it was set up. The Welsh Board had never had the powers of the Scottish Board of Health. This was purely an administrative matter. As to the question of economy, when he decided for reasons which appeared to him sufficient and satisfactory, that he could not appoint any existing member of the Board to be chairman, he had to consider whether he should bring in somebody else. The work of the Board of Health had not been executive, and it had found so little to do that on the average it had met only three times a year during the last nine years. All its work had been done by its members in their individual capacity. It had been extremely efficiently done, and he had not heard any complaints about it. To bring in a chairman, who would really have no functions, at a cost of £1600 a year would be a course in which he would not be justified. It was not his desire to bring into publicity anything in the nature of a reflection upon any member of the staff in Wales. He thought it necessary, in receiving the deputation on the subject, to say something about it, and he thought that they would consider it as a private matter between themselves and himself, but since it had been made public he would say here was a case, not of any dishonourable action on the part of anybody, but of a series of petty personal squabbles that had taken place in the office. He had disciplined and censured those who had been guilty of subordinating the public interest to their own personal prejudices and feelings. The matter was settled, but to put one of those who had been concerned in these internal differences into a position in which he could or might affect the promotion of others with whom the differences had arisen, did not seem to him a step which he could possibly take in the interest of the administration of public health.

Poor-law Relief.

Dealing with the question of poor-law relief, Mr. Chamberlain said they had not found any cases of starvation. There were many cases of hardship, but if it was really to be laid down by the Labour Party that those who were unable to support themselves were to be supported by the State on the same scale as those in full work, he said that it could not possibly be done. Complaint had been made about the reduction of the grant for milk. He much regretted that it should be necessary to make any reduction, but they had to bear in mind that the practice of local authorities as regarded the amount of milk given varied enormously. Some gave nothing at all, and in other areas the expenditure was up as much as £20 per 1000 of the population. All authorities could not be equally right in this matter. They had not laid down in a single case that this special form of assistance to nursing and expectant mothers was to be stopped. They had not forbidden any local authority to give milk or to give as much milk as it chose; all they had said was that they must limit the amount of the Exchequer grant, and the reduction was comparatively small. It was not a matter of policy on the part of the Ministry to reduce the amount of milk; if it had not been for economy he would not have done anything at all, but he would not like to admit that this economy was going to undo the work that had been done in the past in the preservation of infant life. What had happened was that having stated that the Exchequer grant in certain cases would have to be reduced, he had made certain suggestions which the local authorities could adopt if they desired to reduce their expenditure with the least possible disturbance to their existing practice.

Health Conditions in the Hop Fields: Sanatorium Treatment.

With regard to the hop fields the Ministry of Health had very little power beyond that of exhortation. What they needed in this matter was the education of public opinion. No doubt the conditions in the hop fields were very far from being what they should be, and he had done what he could to induce local authorities to adopt model by-laws, and to see that they were carried out. In the absence of further powers it was not possible for him to do more. Conditions were improving, though he agreed that there was much to be done. Captain Bourne had expressed some doubt as to whether they could be satisfied that the money spent on sanatorium treatment was justified by the results. They had not got figures from sanatoria all over the country which would show exactly what happened to people after they had been discharged, but some time ago they got from the Brompton Hospital Sanatorium particulars of between 3000 and 4000 patients who had been discharged. They showed in regard to the moderately advanced cases that after five years 57 per cent. of the males and 67 per cent. of the females were not only alive but apparently in good health; and that after ten years 38 per cent. of the males and nearly 50 per cent. of the females were also alive, and as far as he knew, in good health. That reassuring statement indicated that the money spent upon sanatoria was well spent; it prolonged the life of many people, and saved the lives of a good many others, and even where it was not able to do this, it did much to diminish the infection which otherwise might take place among the healthy population. In regard to housing, it was quite true that the progress made under the Rural Housing Act up to March, 1928, had been singularly disappointing, but in the three months since then progress had been very much faster. The number of dwellings in respect of which applications for assistance had been received, which was 1072 up to March, 1928, had increased to 1500 in the succeeding three months. In regard to housing in general, month after month not only the number of houses completed continued to go up, but also the number of houses under construction; and that number, which was only 48,000 last January, was to-day 59,000. He would be very much surprised if they did not get another 100,000 houses before the end of this year.

The vote was agreed to by 255 votes to 132.

THE LATE DR. HEYWOOD SMITH.—At the age of 90, Dr. Heywood Smith died at Chichester on July 25th. The son of Dr. Protheroe Smith, founder of the Hospital for Women, Soho-square, he was educated at Harrow and Christ Church, Oxford. His clinical training was obtained at St. George's Hospital, and on graduating in 1865 he held a house appointment there before taking up gynæcology as a specialty. He became M.R.C.P. Lond. in 1865, and proceeded to the M.D. degree at Oxford in 1870. Seven years later he published "Practical Gynæcology, a Handbook of the Diseases of Women," based on his experience on the staff of the British Lying-in Hospital and the Soho-square Hospital, to both of which he subsequently became senior physician. Other books and scientific writings followed, and Heywood Smith was one of the founders, and some years later president, of the British Gynæcological Society. On retirement from consultant practice in London he went to live at Hove, where he was living at the outbreak of the late war. Joining a veteran's corps, he was given medical charge of an air-raid station, and later did good work as civil medical officer to the Military Hospital at Chichester, where he finally established himself in retirement.

Dr. Heywood Smith, who was twice married, leaves a widow, two sons who are members of the medical profession, and a married daughter.

Medical News.

UNIVERSITY OF OXFORD.—At a congregation held on August 4th the degree of Bachelor of Medicine was conferred on T. L. Davies and A. J. Leslie-Spinks.

UNIVERSITY OF CAMBRIDGE.—Applications are invited for the Benn W. Levy Research Studentship, valued at £100 a year. They should be sent to Sir Gowland Hopkins at the Biochemical Department before August 14th.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a meeting of the Council held on July 31st, Sir Berkeley Moynihan, the President, in the chair, diplomas of M.R.C.S. were conferred upon 158 candidates (130 men and 28 women) who have passed the requisite examinations and have complied with the by-laws of the College. These candidates are the same as those whose names were printed on p. 259 of our last issue, except that Nellie Brown (Westminster), David W. Currie (Leeds), Yatta Gimpelson (Royal Free and St. Mary's), Ralph H. Morley (Leeds), Bhavani Natarajan (Bombay), H. G. Nimbalker (Bombay and Middlesex), Margaret E. Peaker (King's Coll.), Edith J. L. Smith (Royal Free), G. N. Unnithan (Madras and Univ. Coll.), and Elsie E. Wright (Royal Free and St. Mary's) received their diplomas of Member at a previous meeting of the Royal College of Surgeons, and Thelma Shepherd (Royal Free) received her licence from the Royal College of Physicians on July 31st.

The Diploma of F.R.C.S. was conferred upon Herbert John Seddon (St. Bart.'s), who has passed the requisite examinations and has now attained the required age.

Licences in Dental Surgery were also conferred upon A. M. Bennett and H. A. Lewis, both of the Royal Dental Hospital.

Diploma in Tropical Medicine and Hygiene.—This diploma was conferred (jointly with the Royal College of Physicians) upon the following 33 candidates who have passed the requisite examinations:—

T. D. Amad, Maud C. Cairney, K. Cathiravelu, G. L. Chadha; S. S. Crosse, C. H. Devereux, J. P. M. Donnelly, N. M. Dotivala, Alice M. A. Downing, A. W. Duncan, H. A. Gilkes, M. A. E. Gohar, I. S. Gupta, N. Gupta, M. Jafar, H. C. Johnson, H. Kaitz, Mary Keith-Thompson, J. N. Leitch, K. R. Lundeberg, L. J. McGregor, C. D. Newman, Annie B. Price, E. L. Robert, A. N. Sharma, G. Singh, J. D. S. Thomas, R. F. Tredre, M. K. Tucker, K. H. Uttley, Kathleen A. Vernon, P. L. Whig, and E. R. Wide.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—As the result of the Final Examination of the Conjoint Board held in July, the following candidates were approved in the undermentioned subjects, but are not eligible for diplomas:—

Medicine.—S. Alstead, Liverpool; S. Annaswami, Madras and London; Nancy M. Badeley, Royal Free; S. W. Barber, St. Bart.'s; F. E. Camps, Guy's; Rochelle Churin, Royal Free; C. F. Cosin, Guy's; W. W. Craner, London; T. V. Crichlow, King's Coll.; H. W. D. Crook, Guy's; S. T. Crowther, Cardiff; T. M. Davie, Middlesex; E. L. Edmondson, Cambridge and London; C. N. Evans, St. Bart.'s; N. B. Fadia, Bombay and Middlesex; T. D. Finey and T. Fritz, London; Ruth C. Galletly, Royal Free; H. Gordon, Durham; I. Gordon, St. Bart.'s; E. Hacker, Leipzig and London; F. F. Hellier, Cambridge and Leeds; S. K. Jatar, Bombay and London; D. T. Jones and W. D. G. Jones, Guy's; S. Kin, King's Coll.; L. R. Lalwani, Bombay and London; Florence M. Lessing, Charing Cross; A. L. Light, Leeds; E. R. R. Mellon, Guy's; E. C. Murphy, London; D. A. Nicoll, King's Coll.; J. R. O'Neill, Leeds; C. R. L'E. Orme, Cambridge and King's Coll.; E. R. G. [illegible] ondon; P [illegible] Plummer [illegible]; G. Reah, [illegible]; C. Robinson, Cambridge and St. Bart.'s; S. A. Scorer and S. Shone, Guy's; H. Stark, St. Bart.'s; B. Stewart, Cambridge and Leeds; B. P. Sur, Calcutta; P. R. Thambugala, Calcutta and Middlesex; Ereenwin A. Utting, St. Mary's; and Sybil O. Williams, Royal Free.

Surgery.—Annie D. M. Adams, King's Coll.; A. G. Adrain, St. Mary's; H. H. Aitchison, Oxford and London; G. G. Allan, Univ. Coll.; S. W. K. Arundell, Middlesex; C. P. Bailey, Cambridge and St. George's; J. R. J. Beddard, St. Bart.'s; J. B. Blaikley, Guy's; R. M. Bolam, Cambridge and Durham; B. J. Bouche, Guy's; J. J. Boulle, London; A. M. Boyd, St. Bart.'s; G. H. Bradshaw, Cambridge and St. Bart.'s; F. E. Camps, Guy's; C. E. Caudwell, Westminster; M. A. Chamberlain, Manchester; F. Clifton, Cambridge and St. Thomas's; J. O. Clyde, Middlesex; S. M. Cohen, Cape and Guy's; Elizabeth Cooper, Royal Free; Florence K. Costello, Charing Cross; J. F. Crabtree, Manchester; D. F. L. Croft, St. Bart.'s; H. W. D. Crook, Guy's; S. H. Croot, Cambridge and Guy's; L. E. Daniel, St. Thomas's; T. M. Davie, Middlesex; C. C. Davis, Univ. Coll.; C. J. M. Dawkins, Cambridge and Middlesex; D. C. L. Derry, St. Thomas's; P. C. C. de Silva, King's Coll.;

R. Doyle, Liverpool; J. T. Dunkerley, St. Bart.'s; H. A. Eason, London; Dorothy E. Eglington, Royal Free; J. S. S. Fairley, Cambridge and Birmingham; W. R. Forrester Wood, Cambridge and St. Bart.'s; G. H. V. Froggatt, Sheffield; M. Gamboa, St. Bart.'s; Dorothea L. Gee, Royal Free; W. N. O. George, Univ. Coll.; R. Glanvill, Guy's; D. R. Griffith, St. Thomas's; C. C. Griffiths, Liverpool; Gwendoline E. Grove, St. Mary's; F. R. Gusterson, St. Thomas's; W. G. Harvey, St. Mary's; C. F. Howes, St. Thomas's; Esme I. Hyam, Univ. Coll.; P. G. S. Kennedy, London; R. W. Knowlton, Cambridge and Middlesex; L. W. A. Lankester, Cambridge and St. Thomas's; J. C. Lee, Cambridge and London; A. Levy, St. Thomas's; K. Lindberg, Middlesex; A. G. Lloyd, Durham; O. V. Lloyd-Davies, Middlesex; R. M. B. Lowis, St. Thomas's; T. K. S. Lyle, Cambridge and King's Coll.; R. G. Macbeth, Oxford and King's Coll.; A. L. McFarlane, King's Coll.; E. R. R. Mellon, Guy's; K. G. Milad, St. Mary's; W. B. Millar, Middlesex; V. L. Misso, King's Coll.; G. Morgan, St. Mary's; G. H. Morley, Middlesex; L. H. Mottet and T. Nallainathan, Univ. Coll.; G. Na Ranong, St. Thomas's; G. S. Nightingale, London; Edith G. Niven, Univ. Coll.; W. G. Oakley, Cambridge and St. Bart.'s; R. I. O'Farrell, Sheffield; E. Ogden, Univ. Coll.; A. J. Parer and Keren I. Parkes, King's Coll.; C. T. E. Parsons, St. Bart.'s; A. P. Petigura, Univ. Coll.; A. S. Philps and I. Preiskel, St. Bart.'s; S. R. C. Price, King's Coll.; F. S. C. Pritchard, Guy's; C. B. Prowse, Cambridge and St. Bart.'s; H. D. Pyke, Bristol; A. F. Quarmby, Birmingham; T. G. Reah, Cambridge and London; J. B. A. Reynolds, Cambridge and St. Bart.'s; R. A. C. Rice, St. Bart.'s; G. L. Robinson, Cambridge and London; Alice I. Roughton, Cambridge; E. L. Rubin, Liverpool; D. J. Sagor, Cape and London; C. J. Sanderson, St. Bart.'s; G. H. Sanderson, Cambridge and Univ. Coll.; R. V. Sanzgiri, Bombay and London; N. Schachnowitsch, Guy's; C. P. Scott, St. Thomas's; Mary Scouloudi, Univ. Coll.; J. E. Semple, Cambridge and St. Thomas's; W. H. H. Serasinghe, Middlesex; Mary E. Sharp, Univ. Coll.; S. Shone, Guy's; F. J. G. Slater, Cambridge and Durham: E. Somasekhar, Birmingham; A. Somerville, Sheffield; A. G. C. Taylor, St. Thomas's; J. M. Taylor, St. Bart.'s; L. Taylor, Sheffield; K. A. Thomas, Birmingham; Phyllis D. Towell, Royal Free; S. A. Underwood, St. Mary's; M. H. Wace, St. George's; R. G. L. Waller, Westminster; C. J. Waring, London; C. M. E. Warner, King's Coll.; J. Wasserzweig, London; Olive C. Watkin, Charing Cross; K. Watman, Middlesex; C. E. W. Wheaton, St. Thomas's; D. C. Williams, Cardiff; G. M. Willoughby, Middlesex; Winifred M. Wright, Royal Free; N. Yacoubian, Birmingham; and H. S. T. Young, Cambridge and St. Thomas's.

Midwifery.—Margaret Abernethy, Royal Free; D. A'Brook, Univ. Coll.; Annie D. M. Adams, King's Coll.; A. G. Adrain, St. Mary's; H. F. Apthorpe-Webb, Cambridge and St. Bart.'s; Lucy E. Arthur, Nancy M. Badeley, and Vera R. T. Baylis, Royal Free; R. C. Bennett, St. Bart.'s; W. L. M.Bigby and J. B. Blaikley, Guy's; A. D. D. Broughton, Cambridge and London; H. H. Brown, King's Coll.; M. K. Bryce, London; D. S. Chowdhary, Punjab; J. O. Clyde, Middlesex; G. C. Cochrane, London; S. C. S. Cooke, Middlesex; P. A. Cooper, Univ. Coll.; Florence K. Costello, Charing Cross; D. W. C. Cox, Guy's; T. V. Crichlow, King's Coll ; D. F. L. Croft and J. R. Crumbie, St. Bart.'s; T. J. Davies, Cardiff; C. C. Davis, Univ. Coll.; A. C. Dawes, King's Coll.; J. Donovan, Leeds; R. Doyle, Liverpool; W. J. D'Rosario, Guy's; M. A. A. El Gammal, Cairo; C. N. Evans and A. D. Everett, St. Bart.'s; D. Ezekial, Charing Cross; J. S. S. Fairley, Cambridge and Birmingham; W. B. Fiddian-Green, St. Mary's; C. H. Forsyth, London: R. H. Francis, Cambridge and St. Bart.'s; G. H. V. Froggatt, Sheffield; M. Frohlich, Brussels and Middlesex; R. L. Frost, Guy's; Ruth C. Galletly, Royal Free; B. C. Ghose, Durham; A. Gilpin, King's Coll.; R. Glanvill, Guy's; G. H. A. Graetz, Cambridge and St. Bart.'s; F. W. H. Grenier, London; D. R. Griffith, St. Thomas's: Bryneilen Griffiths and Rosentyl Griffiths, Cardiff; F. R. Gusterson, St. Thomas's; E. J. Hamp, London; Amy F. Hankins, Punjab and Royal Free; C. K. Haskard, Adelaide and London; Dorothy C. Hay, King's Coll.; J. Hopton, St Bart.'s; R. G. S. Howe, Univ. Coll.; Mary A. Hughes, Charing Cross; C. H. Johnson, Guy's; H. C. Johnson, Minnesota; W. H. P. Jonas, Oxford and St. Thomas's; Mary E. H. Jones, Cardiff; R. A. Jones, Cardiff; J. S

Mary L. R. Kennard, St. Mary's; P.

S. Kin, King's Coll.; R. W. Kn

Middlesex; M. Kokia, Westminster; L. W. A. Lankester, Cambridge and St. Thomas's; A. Levy, St. Thomas's; A. R. F. Lotaief, Durham: W. D. Lovelock-Jones, Cardiff; J. N. McArthur, Univ. Coll.; A. L. McFarlane, King's Coll.; Hilda M. C. Macmahon Garry, Liverpool; J. K. Marshall, Oxford and Guy's: S. N. Mathur, Lucknow; R. A. Maynard, Cambridge and St. Thomas's; W. B. Millar, Middlesex; G. Morgan, St. Mary's; G. H. Morley, Middlesex: L. H. Mottet, Univ. Coll.: E. C. Murphy and J. E. Myers, London; Q. St. L. Myles, Oxford and St. Thomas's: T. Nallainathan, Univ. Coll.: R. A. Nash, Guy's; T. H. Negus, St. Thomas's; P. L. Nirula, Punjab; E. Ogden, Univ. Coll.: J. R. O'Neill, Leeds; L. G. M. Page, St. Bart.'s; Keren I. Parkes, King's Coll.; A. P. Petigura, Univ. Coll.: I. Preiskel, St. Bart.'s; S. R. C. Price, King's Coll.: D. L. Pugh, Univ. Coll.: A. F.

B. Rait-Smith, St. Bart.'s; Florenc

Sheffield; H. Richards, Guy's; R. D

Elizabeth B. Robson, Liverpool;

minster; Irene H. Rogers, King's Coll.; B. Rothery, Cambridge and St. George's: H. W. Round, Birmingham; A. S. D. Russell, St. Thomas's; D. J. Sagor, London; H. K. Said, Charing Cross; G. H. Sanderson, Cambridge and Univ. Coll.; R. V. Sanzgiri, Bombay and London; J. E. Schneider, St. Thomas's; J. E. Semple, Cambridge and St. Thomas's; Mary C. Seward and Mary E. Sharp, Univ. Coll.; D. B. Smallshaw, Guy's; A. R. Smith, St. Thomas's; E. Somasekhar, Birmingham; A. Somerville, Sheffield; H. L. Spitz, Leipzig and Middlesex; V. Srinivasan, Madras; E. T. W. Starkie and Mary S. Stuart, St. Mary's; B. P. Sur, Calcutta; I. Taylor, King's Coll.; C. D. Trimble, Birmingham; S. A. Underwood, St. Mary's; Bertha D. Upton-Jones, Royal Free; M. H. Wace, St. George's: R. Warnecke, J. Wasserzweig, and S. N. Wasti, London: Olive C. Watkin, Charing Cross; L. H. Wharton, Bristol: C. E. W. Wheaton, St. Thomas's; J. S. Whiting, Cambridge and St. Bart.'s; A. W. Williams, Cambridge and Westminster; L. V. Williams, St. Bart.'s; G. M. Willoughby, Middlesex; W. R. Winterton, Cambridge and Middlesex; F. G. Wood-Smith, Cambridge and St. Bart.'s: M. G. Woolff, St. Thomas's; N. Yacoubian, Birmingham; and H. M. Yardley and H. S. T. Young, Cambridge and St. Thomas's.

Pathology (New Regulations).—Doris Ascough, Manchester; J. R. J. Beddard, St. Bart.'s; H. J. W. Bergh, St. George's; C. E. Caudwell, Westminster; S. C. S. Cooke, Middlesex: E. F. Hunt, St. George's; H. G. McGregor, Guy's; A. H. Nelson, Charing Cross; T. B. Pitts, Guy's; and J. E. C. Sayers, St. Thomas's.

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.—The Old Students' annual dinner is to be held on Monday, Oct. 1st, with Sir D'Arcy Power presiding.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—Honorary Fellowship of the College has been conferred on Dr. Hugh Hampton Young, clinical professor of urology in Johns Hopkins University, Baltimore.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—The College will be closed for the summer vacation from Monday, August 13th, to Saturday, Sept. 15th, both days inclusive.

ST. MARY'S HOSPITAL ANNUAL DINNER.—The past and present students' annual dinner of St. Mary's Hospital will be held on Friday, Oct. 5th, at 7.30 P.M., at the Trocadero Restaurant, with Dr. E. G. Moon in the chair. The hon. secretary is Dr. A. Hope Gosse.

EXTENSION OF PAIGNTON HOSPITAL.—Sir Mortimer Singer has laid the foundation-stone of an extension of Paignton and District Hospital. The addition provides 20 more beds, a new private ward, a new out-patients' department, and an enlarged operating theatre.

BY a vote of 25 to 12 Bournemouth Borough Council decided on July 31st to sanction the use of unclaimed bodies at the Park Prewett Mental Hospital for anatomical examination at the University of Oxford. The request came from the Ministry of Health through the medical superintendent of the hospital.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL.—Princess Louise, Duchess of Argyll, recently laid the foundation-stone of a wing named after her. It will consist of five floors, the lowest being occupied by a large out-patient department. Each of the other floors will have a ward of 15 beds with operating theatre and the necessary adjuncts. The two upper floors will not be completed, in accordance with the policy of the institution, until the money is in hand. The total cost will be £52,000, of which £28,000 is now available. Princess Louise stated that there is a waiting-list of over 2000 cases needing operative treatment.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On August 13th begins a two weeks' course at the Infants Hospital, starting daily at 2 P.M. and consisting of lectures and demonstrations, together with special visits to other baby welfare centres. On August 27th the Queen Mary's Hospital will begin a two weeks' course in medicine, surgery, and the specialties. In the mornings there will be lectures and demonstrations, while in the afternoons there will be a choice of operations or medical, surgical, or special clinics, followed by a lecture after tea. Special courses in September have been provided as follows: Psychological medicine at Bethlem Royal Hospital; medicine, surgery, and specialties at Westminster Hospital; children at the Queen's Hospital; electrotherapy at the Royal Free Hospital; ophthalmology at the Royal Eye Hospital; orthopædics at the Royal National Orthopædic Hospital. In October the Fellowship will again arrange weekly clinical demonstrations in medicine, in surgery, and in ophthalmology, also a special series at the Wellcome Museum of Medical Science, and a series of lectures on gynæcology, children's diseases, and minor surgery. Detailed syllabuses and other information may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

A COURSE of study on Digestive Pathology will be held at the Hospital de la Santa Cruz at Barcelona from Oct. 5th to Dec. 10th under the direction of Prof. F. Gallart y Monés. Application for enrolment should be made to the *Administración del Hospital de la Santa Cruz*, Depositaría, Barcelona.

PRIVATE PATIENTS AT NORWICH.—Since the Private Patients' Department of the Norfolk and Norwich Hospital was opened in April last, 70 patients have been admitted, and recently not only has every bed been occupied, but there is already a small waiting-list. Payment of 30*s.* a year ensures treatment for a married man and his wife, with children under 16 whose income does not exceed £550 per annum; for a man and his wife, with no young children, whose income does not exceed £450, and for a single person with not more than £350 per annum.

CHRISTMAS MEDICAL TOUR ON THE CÔTE D'AZUR.—For the fifth year in succession a Voyage Médical International is being planned after Christmas to places of medical interest on the Mediterranean littoral. The rendezvous is Marseilles on Wednesday, Dec. 26th, to be followed by a day spent in visiting that port and another at Toulon. Then on successive days will be reached Hyères, St. Raphael, Cannes, Le Cannet, Grasse, Juan-les-Pins, Antibes, Nice, Menton, Monaco, Beaulieu, with opportunity for visiting the Roman citadel of La Turbie, the prehistoric grottoes of Grimaldi, the laboratory of Dr. Voronoff, the observatory of Nice, and other objects of scientific interest. Demonstrations and historical lectures will be given. For further information apply to the President of the Société Médicale du Littoral Méditerranéen, Dr. M. Faure, 24, rue Verdi, Nice, A.M., France.

THE LATE DR. C. H. NEWBY.—Dr. Charles Henry Newby, who died at his home in Ilfracombe on July 11th, was born at Ryde, Isle of Wight, in 1849, and was educated at the Merchant Taylors' School. After qualifying as M.R.C.S. in 1873 he held house appointments at St. Thomas's Hospital, and became surgical registrar there. As surgeon for the National Aid Society he was decorated with the Fourth Order of the Turkish Medjidie after the Turco-Serbian War of 1876. In 1880 he took the diploma of F.R.C.S. Eng. and in 1885 joined the expedition sent to Khartoum for the relief of General Gordon. For his part in this campaign he received the English war medal and the Khedival Star. In the following year he saw service in the Turco-Bulgarian War, gaining the Red Cross of Serbia and the Order of St. Save. Settling in practice at Southsea he became medical officer for out-patients at the Royal Portsmouth Hospital. On retirement to Ilfracombe in 1904 he associated himself with the work of the Tyrrell Cottage Hospital, and acted as its treasurer for many years. He leaves a widow and two daughters.

RATING OF LANCASHIRE HOSPITALS.—A conference to decide the basis of assessment for various buildings of a public character has been held at Manchester between the County Valuation Committee and the Rating Authorities and Assessment Committees of Lancashire. Seventeen assessment committees and 119 rating authorities were represented. It was decided that voluntary hospitals should be assessed, gross, at from 20*s.* to 30*s.* per bed, including the beds of the staff, with additions for facilities for outdoor and special treatment, and paying patients. Rate-maintained hospitals are to be assessed, gross, at from £2 to £4 per bed of patients and staff, likewise with additions for outdoor and special treatment. This scale is to be applied also to mental hospitals, sanatoriums, and similar institutions, with additions where they are justified on account of recreation and other purposes.

THE LATE DR. D. P. COOPER.—The death is reported from Surat, at the age of 93, of Dr. Dosabhoy Pestonji Cooper, a pioneer of Western medicine in the Bombay Presidency. Educated at the Grant Medical College, Bombay, where he graduated in 1863, he was two years later appointed medical officer to the Parekh Dispensary at Surat, where he settled in practice. He was first president of the Surat Medical Association founded in 1886 and in the following year was appointed Khan Bahadur for his public services. In 1899 he was awarded a certificate of merit for his work during the plague epidemic, and for a time he acted as civil surgeon for the city. For nearly 50 years, from 1867, he served the municipality as councillor and he was an honorary magistrate. Among other distinctions conferred upon Dr. Cooper was the Fellowship of the University of Bombay, and he was appointed honorary assistant surgeon to the Viceroy in 1885, receiving the Kaiser-i-Hind silver medal. He was a staunch and active Freemason for over half a century. Of his sons two are members of the medical profession.

KING GEORGE HOSPITAL.—In the recent special distribution of the Wells legacies, King Edward's Hospital Fund for London set aside a grant of £10,000 towards the building fund of King George Hospital, subject to conditions to be agreed. The Fund has been informed that steps will shortly be taken to invite the support of the charitable public for the establishment of the hospital. The scheme, as submitted to the King's Fund, contemplates the provision of additional hospital accommodation for the parts of Essex immediately to the East of London, including the area for which such accommodation is particularly needed owing to the development of post-war housing. The King's Fund proposes to summon a conference with a view to facilitating the execution of the scheme.

THE LATE DR. J. W. MELVILLE.—At the early age of 24 Dr. John Walter Melville died at Liverpool on July 22nd after an operation for appendicitis. Educated at the Barrow-in-Furness secondary school, and at the University of Liverpool, he qualified as a medical practitioner and as a dental surgeon in 1926, and graduated as M.B. in the following year. Last October he was appointed tutor in dental surgery in the University of Leeds, but it was his intention to take up general surgical work, and he resigned this appointment in order to take up the post of resident house surgeon at the Royal Southern Hospital, Liverpool, which he held at the time of his death. The funeral took place at Rampside, near Barrow, on July 25th.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.
Special two weeks Course in Infant's Diseases at the Infants Hospital, Vincent-square, Westminster.

MONDAY, August 13th.—2 to 3 P.M., Dr. W. E. Robinson: Cases of Malnutrition and Intestinal Toxæmia. 3 to 3.45 P.M., Dr. Eric Pritchard: Lecture-Demonstration. Caloric Values. 4 to 5 P.M., Dr. Eric Pritchard: Lecture, General Principles of Nutrition.

TUESDAY.—2 to 3.45 P.M., Dr. Eric Pritchard: Feeding Cases. 4 to 5 P.M., Dr. M. Maizels. Pathological Demonstration. Cerebro-spinal Fluid.

WEDNESDAY.—2 to 3 P.M., Dr. W. E. Robinson: Cases of Rickets and Scurvy. 3 to 3.45 P.M., Dr. Eric Pritchard: Lecture-Demonstration. Modification of Cow's Milk. 4 to 5 P.M., Dr. Elizabeth Karn: Lecture-Demonstration. Ultra-Violet Rays.

THURSDAY.—2 to 3.45 P.M., Dr. Eric Pritchard: Cases of Tuberculosis. 4 to 5 P.M., Dr. W. E. Robinson: Lecture, Respiratory Diseases in Infancy.

FRIDAY.—2 to 3 P.M., Dr. Eric Pritchard: Cases. 3 to 3.45 P.M., Dr. Eric Pritchard. Lecture-Demonstration. Diet of Children. 4 to 5 P.M., Mr. D. Levi: Lecture, Pyloric Stenosis.

SATURDAY.—2 P.M., Visit to Home for Blind Babies, Chorley Wood; and to the Infants Hospital Convalescent Home, Burnham Beeches.

SUNDAY.—11 A.M., Visit to V.D. Centre, Thavies Inn, Holborn-circus. Prophylactic Treatment of Syphilis in Infants.

Appointments.

CAMPBELL, W. S. H., M.B., Ch.B. Edin., D.P.H., has been appointed Chief Medical Officer of Health to the Lindsey (Lincs.) County Council.

HOARE, E. F., M.D., Ch.B. Liverp., Coroner for East Sussex, in succession to the late Dr. W. A. Dow.

MACDONALD, A. D., M.B., Ch.B. Edin., Reader in Materia Medica and Therapeutics, University of Manchester.

SAUNDERS, J. C., M.B., B.Ch., D.P.H. N.U.I., Superintendent Medical Officer of Health and Tuberculosis Officer for Cork-le-Boro.

Certifying Surgeons under the Factory and Workshop Acts: BRAND, W. H. E., F.R.C.S. Edin. (Banchory, Kincardine); and LEWIS, W. B. A., M.B., B.Ch. Camb. (Oswestry, Salop).

Vacancies.

For further information refer to the advertisement columns.

Aberystwyth, Aberystwyth Infirmary and Cardiganshire General Hospital.—H.S. £200.

Ayr County Hospital.—Jun. H.S. At rate of £80.

Barry Accident and Surgical Hospital.—H.S. At rate of £200.

Bath, Royal United Hospital.—Asst. H.S. £100. Also H.S. and H.P. Each £120.
Bedford County Hospital.—H.S., also Asst. H.S. At rate of £175 and £130 respectively.
Birmingham, General Hospital.—Med. Reg. and Res. M.O. £155.
Bolton, Townleys Hospital, Farnworth.—Second Asst. M.O. £225.
Bootle, Bootle Borough Hospital, Derby-road.—Sen. M.O. Also 2 Jun. M.O.'s. Each at rate of £150 and £125 respectively.
Bradford, Municipal General Hospital (St. Luke's).—H.P.'s and H.S.'s. Each at rate of £200.
Canterbury, Kent County Mental Hospital, Chartham.—Jun. 4th Asst. M.O. £300.
Canterbury, Kent and Canterbury Hospital.—Hon. Surg. to Ear, Nose and Throat Department. Also Third Res. M.O. At rate of £125.
Cardiff, Prince of Wales' Hospital.—H.S. £100.
Carmarthen, Joint Counties Mental Hospital.—Jun. Asst. M.O. £300.
Dreadnought Hospital, Greenwich.—Surg. to Out-patients.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—H.P. At rate of £125.
Glasgow, University of.—Gardiner Chair of Physiological Chemistry.
Ilkeston, Borough of.—M.O.H. and School M.O. £800.
Leeds, City of.—Asst. M.O.H. for Maternity and Child Welfare. £800.
Leicester, City Education Committee.—Asst. School M.O. £600.
Maidstone, Kent County Mental Hospital.—Med. Supt. £1000.
Manchester Royal Infirmary.—Jun. H.S. At rate of £100. Also Hon. Asst. Radiologist and Electro-Therapeutist.
Market Drayton, Salop, Cheshire Joint Sanatorium.—Asst. M.O. £250.
Newcastle-upon-Tyne, Wingrove-road, Westgate-road.—Res. M.O. £250.
Nottingham Children's Hospital.—Res. H.P. At rate of £150.
Nottingham City.—M.O.H. £1440.
Oldham Royal Infirmary.—H.S. At rate of £175.
Plymouth, Homœopathic and General Hospital.—H.S. At rate of £100.
Reading, Royal Berkshire Hospital.—3rd H.S. £150.
Rotherham, Rotherham Hospital.—H.P. £180.
Royal Northern Hospital, Holloway, N.—H.S. At rate of £70.
Swansea General and Eye Hospital.—Hon. Phy. Also Sen. Res. O. £250.
West [illegible]h and District General Hospital.—[illegible] H.S. Each at rate of £200.
West [illegible] 155, Marylebone-road, N.W.—Jun. Non-Res. H.S. At rate of £100.
West London Hospital, Hammersmith-road, W.—Non-Res. Cas. O. £5 5s. per week.
Winchester, Royal Hampshire County Hospital.—Hon. Physician.

Births, Marriages, and Deaths.

BIRTHS.

JEPPS.—On July 27th, at St. Quentin, Broadstairs, the wife of Dr. J. W. W. Jepps, of a son.

LINELL.—On July 22nd at Wellesley Hospital, Toronto, to Frances, wife of Dr. Eric A. Linell—a daughter.

LLOYD.—On August 1st, at 29, Bramham-gardens, S.W., to Olive, wife of W. Ernest Lloyd, M.D., M.R.C.P.—a son.

MARRIAGES.

DAGGETT—SIMPSON.—On July 30th at St. Martin-in-the-Fields, London, William Ingledew Daggett, M.A., M.B. Camb., F.R.C.S. Eng., to Eileen Hilda, youngest daughter of Colonel and Mrs. Simpson, of Fowey, Cornwall.

LEWIS—IRVINE.—On July 31st, at All Saints' Church, Panarth, Kingsley Wassell Lewis, M.B., B.S., M.R.C.S., L.R.C.P., to Florence Henrietta, third daughter of the late Henry O. Irvine, of Southerndown, and of Mrs. Irvine, of Salisbury-avenue, Panarth.

MACINNES—MASTERMAN.—On August 1st, at St. Giles's Church, Camberwell, the Rev. Angus Campbell Macinnes, to Florence Isabella Joy Masterman M.B., B.S. Lond.

MARTIN—GARFIT.—On July 31st, at Partney Church, Lincolnshire, Peter Henry Martin, B.M., B.Ch., M.R.C.P., to Phyllis Mary Garfit, third daughter of the late Bartholomew Claypon Garfit and of Mrs. Garfit, of Dalby Hall, Spilsby.

MUNRO—LOWTHER BOUCH.—On August 2nd, at Ackworth Parish Church, James Gibson Munro, M.B., Ch.B., of Kimberley, Nottingham, to Lilias Anne, eldest daughter of J. Lowther Bouch, Rector of Ackworth.

SCHOLEFIELD—DEAN.—On July 28th, at Caerphilly, South Wales, Bernard Graham Scholefield, D.M., F.R.C.S., to Queenie, younger daughter of Mr. and Mrs. C. H. Dean, of Berwyn, Caerphilly, South Wales.

DEATHS.

BURT.—On August 5th, at Langdale, Salisbury-avenue, Harpenden, William Burt, M.B., B.S. Lond., late of Finchley.

CARROLL.—On August 1st, at 3, Artillery-mansions, Woolwich, Louis Ely Reginald Carroll, M.R.C.S., L.R.C.P.

HENTSCH.—On August 1st, George Frederick Hentsch, L.R.C.P., M.R.C.S.

MARSH.—On August 1st, at Mosley House, Boothstown, James Marsh, M.B., C.M., late Medical Officer of Health, Atherton.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE RED CROSS IN TIME OF PEACE.

AFTER ten years of peace it is well to be reminded that this generation can never lose the scars of war; the work of the Red Cross emphasises facts which most of us find it easy to forget. The eighth report of the joint council of the Hospital of St. John of Jerusalem and the British Red Cross Society, which covers only nine months, shows that their excellent work for ex-Service men has continued actively. During this period 308 tuberculous officers were helped, bringing the total since 1914 to 17,798. As time goes by, applicants find it increasingly difficult to satisfy the Ministry of Pensions that their disability is due to war service, and the Red Cross gives the necessary assistance while a case is pending. Other officers have finished their course at a sanatorium, but need financial aid in securing specialties of diet while on home treatment. Others, again, are helped with travelling expenses to Switzerland or the Riviera. The hospital at Brighton was filled the whole time, and some of the patients were very seriously ill when admitted.

An important activity of the fund is the provision of materials and training in various handicrafts for pensioners who cannot train in the hospital workshops. Approximately 1000 men were helped in this way during the nine months. The industries taught are increasingly popular and the medical superintendents speak highly of the great benefit conferred. Ex-Service men in Ministry of Pensions' hospitals are sent Christmas presents of the value of 5s. each, and over 2000 of them were cheered in this way on Christmas Day, 1927. About 13,000 men were taken out for drives or rides, or transported to entertainments. Although a number of Ministry hospitals have been closed, the diminution in the number of men still under treatment is not very great; they are simply being concentrated in larger institutions. The Emergency Help Committee, founded to give temporary emergency relief to ex-Service men and their widows and dependents, has also continued active. Many men, handicapped by disability, have been rendered self-supporting. 18,353 new cases were assisted during 1927, but no fewer than 12,187 applications were refused on the ground that there was no definite end in view or that they were ineligible or undeserving. One activity of this committee is to provide motor attachments to invalid chairs, and already 357 heavily disabled pensioners have thus been enabled to travel about without fatigue. The Games and Comforts Fund made 238 grants for wireless and cinema apparatus, musical instruments, cigarettes, clothing, bagatelle and billiard tables, gramophones, and all kinds of outdoor and indoor games. The Spero Firewood Factory for tuberculous ex-soldiers had to be closed down, but was fortunately able to reopen as the result of a special grant. From the medical point of view the factory proved most successful. The experiment of Scio House—a comfortable, "homely" institution for ex-officers suffering from advanced tuberculosis—has proved an unqualified success.

No less important than this continuing war work are the activities of the Red Cross Home Service Ambulance Committee, whose vehicles carry a steadily increasing number of sufferers every year. Modern methods of diagnosis and treatment depend so much on immovable mechanical apparatus that the mobility of the sick is becoming really important. In 1920, each of 273 ambulances carried an average of 125·6 patients. In 1927 the average had increased to 267·7. First-aid boxes are being set up on main roads, and all over the country members of the Order and Society spend their week-ends and holidays on the roads, armed with splints, bandages, and dressings. Considering the fact that 138,774 accidents, involving death or injury, took place on the roads of the United Kingdom in 1926, the Council feels justified in appealing for more voluntary workers for this service. The mobile X ray service is being *increasingly* used and a second car has been equipped.

THE INTERNATIONAL HANDBOOK OF CHILD CARE AND PROTECTION.[1]

SINCE the first edition of this remarkable book appeared in 1924 200 pages have been added to its bulk and 3*s.* to its price. The somewhat inadequate "International Who's Who" has disappeared, its place being taken by a useful bibliography, and a much fuller index than heretofore enables the inquirer to find more easily the particular information he desires. Mr. Edward Fuller, who has carried out the arduous task of compiling a record dealing with 300 countries or political units, excuses himself for inequalities of presentation, pointing out that the details are supplied in various forms and a dozen languages, that some replies are received two years after sending out the questions—though the Governor of Guadeloupe is the only one bold enough to state that his statistics are authoritative for five years—while there is no sort of agreement among English-speaking people as to what they mean by "child welfare." Many surprises are met with in turning over the pages of this volume; for instance, that child welfare work has been carried on in Afghanistan since 1910, that both infant vaccination and education are compulsory in the Bahamas but neither in Barbados, that abortion is legal in Russia, that no less than 2,300,000 children in Germany are cared for by public and private charity, and that the infant mortality-rate in the Republic of Cuba is only 31 per 1000, falling to 20 in the city of Havana. Mr. Fuller says that his purpose is to place his readers "in possession of information which is not available in any other single volume or in any one country (and in many instances not at all outside official documents not always published) leaving each reader to marshal the facts as he will and to make his own comparisons." The book is admirably suited to fulfil this aim.

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[1] Third edition. Compiled from official sources by Edward Fuller. London: Longmans, Green and Co., Ltd., and the Weardale Press. 1928. Pp. 646. 10*s.* 6*d.*

NITRITES IN SEA-SICKNESS.

Dr. J. F. Pearcy and Dr. D. B. Hayden, of Chicago,[1] believe that sea-sickness is mostly, if not entirely, due to over-stimulation of the vestibule. In studying the effects of blood pressure on labyrinthine function, they found that sodium nitrite, by lowering the blood pressure, markedly diminished nystagmus and past-pointing after rotation. When Dr. Hayden found himself among 16 sea-sick people on an Atlantic boat he naturally tried sodium nitrite. Eight of them were left to suffer and remained ill for an average of two days, despite injections of epinephrine hydrochloride. The eight who took grs. 3–5 of sodium nitrite every two hours were all comfortably eating on deck in an average of four hours, and did not relapse. Dr. A. Sellheim,[2] of Leningrad, has treated 20 cases with a drop of a 1 per cent. solution of nitroglycerine in water or two drops of a ½ per cent. solution on the tongue. All the patients recovered. There seems to be scope for the trial of these methods, but vigorous reduction of blood pressure is not without its dangers, and the nitrites and nitroglycerine are drugs to be handled with considerable caution. If their effect should prove to be mainly psychological some milder vehicle for faith would be preferable.

A HANDY CARD-INDEX CLIP.

Messrs. Cooper, Dennison, and Walkden, Ltd. (7 and 9, St. Bride-street, London, E.C. 4), have sent us specimens of the "transparent" card hinge, invented by Dr. J. M. F. Whitby, to which attention has already been called in our columns. The device consists of two circular discs of transparent linen stitched together down the centre and having their opposing surfaces gummed. They are adapted for use in any card-index cabinet, as one record card can be quickly attached to another which has been filled up, thus making up a book of cards. The salient points about the hinges which are already in use by insurance practitioners and others are their cheapness, ease of manipulation, saving of labour, and readiness to hand. The price is 1*s.* per box of 100, 7*s.* 6*d.* per box of 1000, postage extra.

ANIMALS AND REASON.[3]

Dr. Warden, who is assistant professor of psychology in the Animal Laboratory, Columbia University, has written a brief account of how man throughout the ages has interpreted what he has been able to learn of animal life. The story of science in its larger meaning, he points out, is the story of an unceasing attempt on the part of man to understand his own place in the natural order of things, and he surveys accordingly the facts that have emerged and the opinions that have been expressed along the lines of comparative pyschology indicating the rise of this branch of learning to an exact science. Noting that the space made available by the format of the series has only permitted the briefest attempt at an historical survey, his hope is that he may be able to place modern movements in proper historical perspective, and his object is attained. He deals with his subject under five headings, ancient animal lore, the Greek influence, the psychology of the Early and Middle Ages (the period covering the decline of the Roman Empire and the rise of Christianity which terminates with the sixteenth century), the period between the opening of that century and the establishment of Darwinian principles, and, finally, with the experimental methods which have brought comparative psychology to-day into an exact science. He regards Darwin as the founder of moderr [illegible] as when the doctrine of evolution had [illegible] "a measure of sanity in interpreting a [illegible] ie apparent, but in a technical closing section—the longest—he shows where experimental methods have conducted the leaders of the science. A very interesting little book.

NEW PREPARATIONS

Citobaryum.—This [illegible] Napp, Ltd., 3 and 4, [illegible] the large modern deve [illegible] meal has become a fa [illegible] sulphate is largely replacing bismuth carbonate as an aid for outlining the alimentary tract. The manufacturers have put the preparation on the market, the insoluble sulphate for X ray diagnosis, in a palatable and convenient form, and it is supplied in packets of 150 g., this quantity being estimated as needed for one examination. Full directions for use are supplied and stress is laid upon the fact that the granular external character of the salt disappears if the directions are followed leaving a meal free from objectionable sedimentation.

Shadoform is a special preparation for the ready production of a liquid barium meal issued by the British Drug Houses, Ltd., Graham-street, City-road, N. 1. Its advantages lie in the ease with which the meal can be prepared—it requires merely to be mixed with water—in the thin cream-like consistency of the meal and the complete absence of lumps or grit, in its palatability and opacity, and in the remarkably long time the solid matter remains in suspension. Shadoform is issued in packages of four sealed boxes, each of which contains the equivalent of 4 oz. of chemically pure sulphate of barium.

SIR MORELL MACKENZIE'S BIRTHPLACE.

To the Editor of THE LANCET.

SIR,—Some of your readers interested in medical history who happen to be in the neighbourhood of Leytonstone, London, may like to glance at the house where Sir Morell Mackenzie was born in July, 1837. The old house, with the worn stone steps and the shop in front, is now empty and dilapidated, and if not shortly pulled down may be painted by a new tenant out of knowledge. The house stands at the corner of Browning-road, Leytonstone, which is a small antiquated road turning off the main road, quite close to the "Green Man" Inn, which is advertised as a stopping place by all the tramcars and buses. In all the obituaries I have read no mention is made of the exact spot. The visitor will find a tablet let into the side of the house about 20 ft. from the ground, which commemorates the fact.

I am, Sir, yours faithfully,

OBSERVER.

London, August 7th, 1928.

ACTIVE TREATMENT AFTER ELECTRICAL TRAUMA.

ELECTRICAL injuries, perhaps more than any other, call for conservative treatment as a general rule. The reason for this is the tendency of the affected tissues to necrosis and hæmorrhage. Nevertheless, as Prof. S. Jellinek[1] has recently pointed out, active measures are called for by certain definite indications. Rupture of vessels may give trouble in the third or fourth weeks, and however carefully ligatures are applied they are always liable to cut through the altered vascular wall. Cerebral œdema calls for lumbar puncture, an operation which this authority recommends as a first-aid measure in all electrical accidents. Amputation and surgical intervention, usually with the object of removing damaged tissues, should be rigidly avoided except when there is disturbance of the general health and its cause is undoubtedly the local lesion. Prof. Jellinek insists strenuously that the ordinary rules of pathology frequently do not apply here, and that hundreds of these operations are performed unnecessarily. A fourth indication is the division of nerves by wire or metallic edges. Otherwise the more conservative the treatment of electrical injury the better.

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[1] Wien. klin. Woch., 1928, i., 766.

CLOSING OF WAR HOSPITALS.—Two of the great Birmingham War Hospitals, Uffculme and Sorrento, were closed last week, being no longer required for their original purpose. From 1919 to 1923 Uffculme was devoted solely to orthopædic and limb cases; since then it has been used for general surgical and medical cases, and as a centre for the supply and repair of artificial limbs. Sorrento, which was used mainly for paraplegic cases, will now become a maternity home under the City Health Committee.

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[1] Jour. Amer. Med. Assoc., 1928, xl., 1193.

[2] Brit. Med. Jour., 1928, i., 214.

[3] Psyche Miniatures. An Outline of Comparative Psychology. By C. J. Warden, Ph.D. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1928. Pp. 117. 2*s.* 6*d.*

A Contribution
TO THE STUDY OF
CHOREA.
THE SYMPTOMS WHICH RESULT FROM INJURY OF THE CORPUS LUYSII.

By J. PURDON MARTIN, M.D. Belf.,
M.R.C.P. Lond.,
ASSISTANT PHYSICIAN TO THE NATIONAL HOSPITAL FOR NERVOUS DISEASES, QUEEN-SQUARE; AND PHYSICIAN TO THE SEAMEN'S HOSPITAL, GREENWICH.

THE corpus Luysii, corpus subthalamicum or body of Luys, is an almond-shaped ganglion situated just below the optic thalamus (see Fig. 1); it lies immediately internal to the fibres of the pyramidal tract as they pass down from the internal capsule to the pes of the cerebral peduncle. Medial to it is the red nucleus and that complicated space known as Forel's field; below it is the substantia nigra. Its greatest length measures about 1·2 cm. The fibres which enter it come almost entirely from the lenticular nucleus, passing in considerable numbers across and around the internal capsule; of its efferent fibres some, as will be shown, descend into the mid-brain behind the substantia nigra, and a few cross under the floor of the third ventricle to the corpus Luysii of the other side. The knowledge of its connexions is still very incomplete. Of its functions I think it is fair to say that there has hitherto been no knowledge, although a few observers have drawn tentative conclusions from isolated cases.

In a paper read at the combined meeting of the American Neurological Association and the Neurological Section of the Royal Society of Medicine, held in London last July, a description was given of the following case, in which the only lesion found post mortem to which the symptoms observed during life could be ascribed was a small hæmorrhage destroying and practically limited to the body of Luys of the left side of the brain.

History of the Case.

The patient was admitted to the Seaman's Hospital under my care on Feb. 12th, 1927, and subsequently transferred to the National Hospital, Queen-square. He was a man of large build, aged 62, formerly a seaman, and latterly employed as a night watchman on board ships in dock. He had had no previous illnesses, but at the time he came under observation had very atheromatous arteries, his systolic blood pressure was 190 mm. Hg, and he had a considerably enlarged heart; the Wassermann reaction in his blood was positive.

Except for frequent headaches during the preceding six months, he had been well until Feb. 8th. On that morning, about 8 o'clock, just after arriving home from his night's work, he felt giddy, staggered, and had a severe pain in the right side of his body. He sat down for a little, then felt better, had a meal and went to bed as usual. When he woke up at 4 o'clock in the afternoon he tried to take a cup of tea sitting up in bed, but his right hand "shook" so violently that he spilled most of the tea and he could not bring his cup to his mouth. Even when his wife held the cup he could not drink normally, but, as his wife described it, "he slopped the tea into his mouth and gulped it down." When he got up that evening to go to his ship his right arm was twitching and swinging about widely, and "he was throwing his right leg about," but, with some assistance from his wife, he managed to walk. When his wife saw him again, two hours later, the involuntary movements had become much worse, but in the morning he managed to walk home. His condition remained much the same for the next 36 hours, but on the evening of Feb. 10th he became very agitated and unreasonable, turned on his wife as he had never done before, and in such a way that she was afraid of his violence; his involuntary movements were then worse than ever. The next day he remained in the same angry and uncontrollable mood, and in the evening made his way down to the ship. On the fourth morning after the onset of his illness he fell in his house, and that day he was brought to hospital.

Condition on Admission.

When I first saw him, and until his death 15 days later, his condition was as follows. While he was awake his right arm and leg were unceasingly tossed about in a violent chorea. The movements occurred at all the joints of these limbs, but an unusually severe involvement of the shoulder and hip and elbow and knee gave them an amplitude not often seen in chorea. In form they presented every combination of flexion, extension, and rotation; they were quite irregular. They were free, quick movements, unhampered by any degree of spasticity. Their violence was such that the skin had been knocked off the knuckles and other parts of the affected hand, and also of the inner sides of both knees. The movements were continuous during the waking state, though they varied somewhat in intensity, being less when the patient was alone, and worse when he was called up to answer questions or perform test movements. With a great effort the patient could hold the right arm steady for about 20 seconds, every muscle of the limb being then taut in contraction. The right side of the head and face and the tongue were involved in the chorea, and to some degree the right side of the trunk. The patient usually lay with his head and eyes turned to the right, and he seemed to try to put the right hand under his head in order with his head to fasten it down on the bed and so restrain its movements. The movements of the face were less than was to be expected from the severity of the chorea in the limbs. In the early days of the illness articulation, though affected, was still distinct, but later it became greatly slurred. Swallowing was performed by spasmodic gulps. Breathing was always irregular, and was sometimes difficult owing to the irregular movements of the muscles of the throat, chest, and abdomen. All these abnormal movements ceased entirely during sleep. The patient's facial expression suggested great anxiety and restrained anger, and this seemed to be a true reflection of his mental state; during his stay in hospital he was at times irrational and uncontrollable, especially towards night; in the latter part he was at times disorientated, and often in a frenzy. Associated with the movements was a moderate degree of sweating, almost confined to the affected side; the patient while awake always looked hot, and the jactitated limbs felt warm and moist. The body temperature, as registered on the chart, remained steadily at 97° F. until a few hours before death. The temperatures of the two sides of the body were unfortunately not compared.

Neurological Examination.

Further neurological examination revealed few other abnormalities. Voluntary power was normal in all the limbs. There was no sensory loss to pin-prick or light touch; at the first examination, but not subsequently, there seemed to be a slight hyperæsthesia of the choreic arm. The sense of position was normal, and pointing tests, including the Bránáy tests, were accurately performed; pointing with the right hand was accompanied by choreic deviations of the moving limb, and the point indicated was touched by a finger, as it were, in flight. The appreciation of vibration was normal. The tendon-jerks were present in both arms and about equal on the two sides, those in the right arm being, if anything, less; the knee-jerk was definitely less on the affected (right) side than on the left; the ankle-jerks were approximately equal. The plantar responses were both definitely flexor throughout the illness. The abdominal reflexes were not obtained. The optic discs were normal, the pupils were approximately equal, but neither was quite regular; both reacted to light, and as far as could be determined they reacted also to accommodation; the external ocular movements were full, but the eyes when at rest were usually deviated to the right. Except for the abnormal movements in the face, throat, and tongue, the functions of the remaining cranial nerves were normal.

The patient died on the twentieth day from the onset of the chorea. A post-mortem examination was performed by Dr. J. G. Greenfield 12 hours after death, and the brain was hardened for a week in 10 per cent. formol saline before being cut. Subsequent section showed a recent hæmorrhage destroying the body of Luys of the left side—i.e., of the opposite side of the body to the chorea; except for scattered hæmorrhagic points there was no other lesion in the brain.

The examination of serial microscopic sections showed that in its vertical extent and antero-posteriorly the injury corresponded closely with the limits of Luys's body, and in lateral extent it transgressed these limits only by one or two millimetres in each direction. A small dorsal fragment of the corpus Luysii remained. The red nucleus was not reached by the hæmorrhage at any level, and none of the known important fibre-tracts was interrupted.

The photograph which is shown here (Fig. 2) is that of a horizontal section of the brain, which passes on the left side through the lesion below its middle, and through the upper half of the red nucleus; the right half of the brain is cut appreciably lower (as is shown by the section of the optic tract), and only a small portion of the body of Luys of that side is seen. The actual area of destruction is seen surrounded by a zone of staining. Its length at this level was almost exactly 1 cm., and its breadth ½ cm., but at a higher level its breadth was slightly greater. A more detailed description of the pathological anatomy is given in the original paper.[1]

FIG. 1.

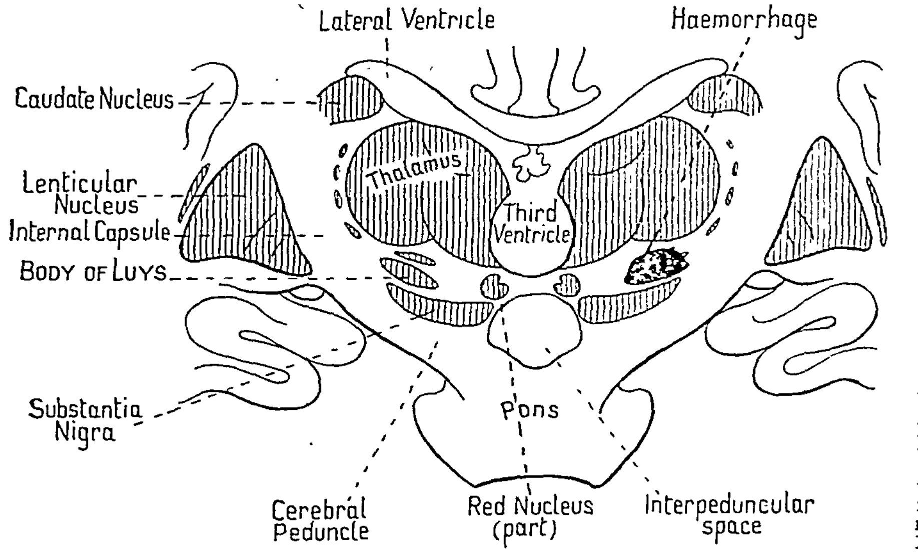
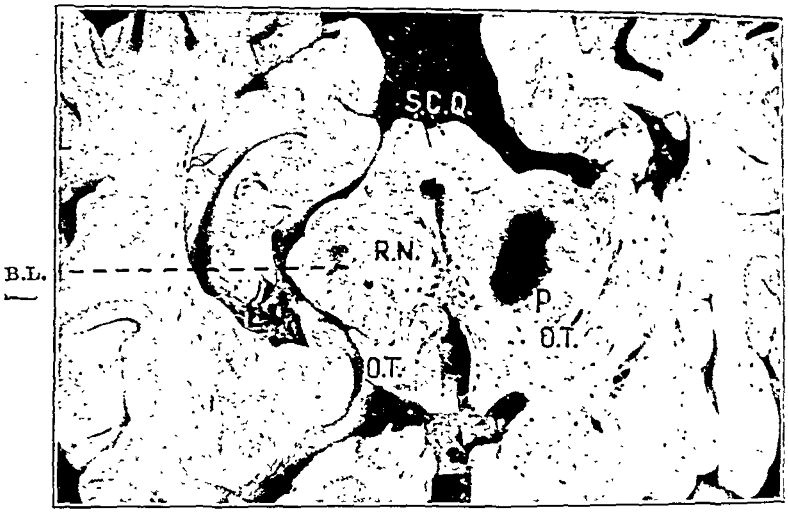


Diagram of a vertical transverse section of the brain to show the anatomical relations of the body of Luys and the extent of the hæmorrhage in the case described.

Similar Cases in the Literature.

It is impossible to assess the physiological significance of the findings in such a case except in conjunction with similar findings and with experimental work. There are in the literature of the last 50 years 12 cases, sufficiently described, in which *localised lesions of the body of Luys* have been found after death, and a number of other cases in which the body of Luys was involved in more extensive lesions. Closely comparable to the case described above are those of Fischer, Campora, Pette, Canfield and Putnam, Economo and Jakob, of which I give the following brief notes:—

FIG. 2.



Horizontal section of the brain passing through the lower half of the hæmorrhage. The area of actual destruction is surrounded by a zone of staining. B.L. = body of Luys; R.N. = red nucleus; S.C.Q. = superior corpora quadrigemina; P. = cerebral peduncle; O.T. = optic tract; and L.V. = left ventricle.

Fischer, 1911.—Female, aged 72. Sudden onset of left hemichorea with very large movements; face considerably affected. Articulation and swallowing disturbed. No mental disturbance. Death on the fourth day.

At post-mortem examination a hæmorrhage was found destroying the right body of Luys "and only this." There was a superficial cortical defect on the orbital surfaces of both frontal lobes.

Campora, 1922.—Female, aged 70. Abrupt onset of violent chorea in the left side. Face involved; articulation and swallowing affected. Pronounced hypotonia of affected side. Some psychic disturbance. Death after five weeks.

At post-mortem examination a small hæmorrhagic fissure was found in the *right* subthalamic region, 1 cm. in length, running transversely above the pes pedunculi. It destroyed most of the corpus Luysii, leaving only its most lateral part intact; medially, it extended into Forel's field and just touched the capsule of the red nucleus; the internal capsule was not involved.

Pette, 1922.—Female, aged 69. *Carcinoma* of the breast three years before. Sudden onset of chorea of the whole of the left side. Death four weeks later.

Post-mortem examination showed a carcinomatous deposit the size of a pea in the right regio-*subthalamica*; the body of Luys was mostly destroyed (private communication); red nucleus, thalamus, corpus striatum, and cerebellar peduncles all intact.

Canfield and Putnam, 1884.—Male, aged 59. Slight right hemichorea for several weeks, then sudden exacerbation. Face little involved. Articulation affected. No sensory loss. Knee-jerk and ankle-jerk normal on right, absent on left. The patient could walk without assistance. Death three weeks after the onset of severe chorea.

Post-mortem examination showed a hæmorrhagic softening the size of a large pea "in the medial half of the left crus, opposite the posterior portion of the thalamus; it involved the substantia nigra and the pes beneath to a depth of 5 to 6 mm., and the tegmentum above almost to the nucleus ruber. The only ganglionic matter involved besides the substantia nigra was the so-called ganglion of Luys."

v. Economo, 1910.—Male, aged 71. Sudden onset of violent chorea of the left side 24 hours after a slight stroke causing some weakness of this side. Articulation affected. Transient right hemi-amblyopia. Mental disturbance. Death seven days after the onset of the chorea.

Post-mortem examination revealed a hæmorrhage the size of a cherry-stone lateral to the red nucleus, in the substantia nigra and in the tegmentum, involving the regio subthalamica and the corpus Luysii, and extending ventrally into the pes.

Jakob, 1923.—Female, aged 75. Sudden onset of left hemichorea with large movements. Conjugate deviation of the eyes sometimes to right, sometimes to the left. Condition remained unchanged for three weeks; then 24 hours before death the patient became comatose and the limbs of the left side were at rest and very flaccid. On the right side some spasticity. Death from broncho-pneumonia on Nov. 3rd, 1921.

At post-mortem examination a recent hæmorrhage was seen, entirely destroying the body of Luys on the right side, and strictly confined to this ganglion, pushing Forel's bundles H 1 and H 2 upwards: it was sharply demarcated from the internal capsule and the substantia nigra. Medially, it extended beyond the bounds of Luys's body, but did not touch the red nucleus. Many hæmorrhagic points in the basal ganglia of both sides. Some small hæmorrhagic foci in the left internal capsule.

With these I think we may group the following case, though its anatomical description is not quite precise.

Magnan,[2] 1870.—Male, aged 73. Sudden onset of right hemichorea. Violent movements. Death after five days.

Post mortem "a section made through the left cerebral peduncle at its insertion into the optic thalamus revealed a hæmorrhagic focus of the size of a small nut." This was the only recent cerebral lesion.

Confirmatory evidence of the results of injury to the corpus Luysii is afforded by the remaining cases, in which there was more than one small lesion in the brain, one of the foci in each case destroying Luys's body.

Such cases have been recorded by Greiff, Touche, Bianchi (second case), Bremme and Matzdorff.[3] In all of these the clinical syndrome was the same as in the cases already described, with some complication corresponding to the other lesions. In Bremme's case the damage was caused by secondary carcinomata, in Bianchi's by patches of sclerosis, and in the other cases by hæmorrhage or thrombosis. Matzdorff's report requires special mention; it was apparently in the press at the time at which the paper I have referred to was read, and the author, citing seven of the cases I have mentioned, described independently as "The syndrome of the corpus Luysii" the main elements of the symptom-complex put forward under a similar title in my paper. But Matzdorff relates that his patient had been seen during life by Prof. Jakob, and the latter, who had had a similar case several years before, expressed the opinion (Wahrscheinlichkeitsdiagnose) that there was a lesion of the corpus Luysii of the opposite side of the body to the chorea. This must surely be the first case in which such a diagnosis has been correctly made, even tentatively, during life, and it marks a stage in the knowledge of the subject. Pathologically Matzdorff's case is important because the softening was entirely confined within the limits of Luys's body.

Of less physiological value than the foregoing, but still worthy of mention, are cases in which the corpus Luysii was involved in a lesion which extended widely beyond its borders. Such are Bianchi's first case (tuberculoma), and the cases of hæmorrhage recorded by Lewandowsky and Stadelman, and by Lloyd and Winkelman; probably the case recently described by Weil[4] falls also into this group. In all of these cases the same choreic syndrome was present during life.

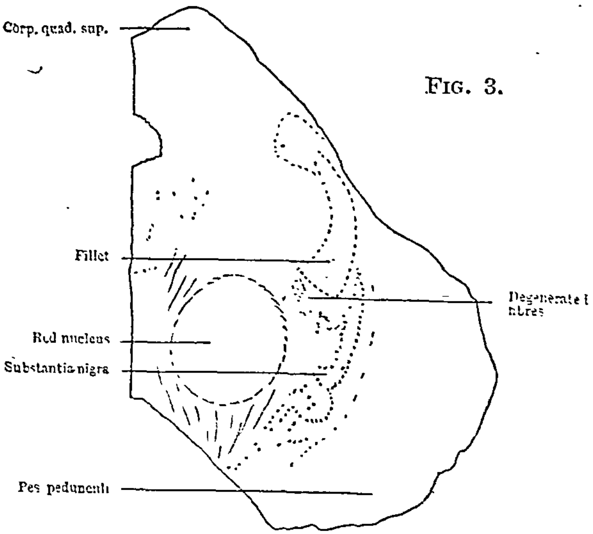
To the experimenter the body of Luys is not easily accessible, and the only experiments actually involving it are those of d'Abundo.[5] He found that in kittens his lesions of the subthalamic region (including Luys's body) invariably produced a chorea of the opposite side of the body, and rotation of the head to the side of the chorea.

Fibres Descending from the Corpus Luysii.

It has been said that the efferent connexions of the corpus Luysii are very imperfectly known. In my case, blocks of cerebral tissue from above and below the site of injury were impregnated by the Marchi method, and these when cut showed a small but definite bundle of degenerated fibres beginning immediately caudal to the destroyed corpus and passing down the mid-brain (see Fig. 3). It lay immediately behind the substantia nigra, and soon joined the medial margin of the medial fillet. It seems most probable that the fibres composing this bundle issue actually from the corpus Luysii, and it is consequently to be expected that a small lesion interrupting them would give rise to the same symptoms as an injury to the body of Luys itself. However that may be, there are in the literature of the last 50 years only two cases in which hemichorea was attributable to a focal lesion at a lower level than the corpus Luysii, and in both these cases the sites of damage, though widely divergent, were so situated that this bundle of fibres was interrupted. The first is a case by Bianchi in which the only damage in the left half of the brain (to account for a right hemichorea) was a patch of sclerosis which lay mainly in the middle third of the pes pedunculi and had spread backwards through the substantia nigra to involve the medial portion of the fillet. The second is a well-known case described by Bonhoeffer in which the main lesion was due to a carcinomatous mass at the decussation of the superior cerebellar peduncles, but to the left of this there was a small deposit interrupting the medial margin of the left fillet; the patient had had a right hemichorea. With the knowledge of the other cases now at our disposal it seems legitimate to ascribe the symptoms in this case to the latter lesion.

In animal experiments chorea of the opposite side of the body has been produced by Economo and Karplus[6] by lesions which interrupted, inter alia, the medial margin of the fillet, and by Lafora[7] by lesions directed towards the superior cerebellar peduncle, and therefore also interrupting these fibres. Chorea, as far as I have discovered, has not been obtained experimentally by any lesions other than those mentioned.

FIG. 3.



Outline drawing of a section through the upper part of the left half of the mid-brain to show the position of the degenerated fibres.

It is therefore in conformity with the clinical and experimental facts that interruption of the fibres which appear to descend from Luys's body gives rise to symptoms similar to those resulting from injury to the body itself. Unfortunately it has not been possible to follow the degenerated fibres to their termination, and their ending is unknown.

The Syndrome of Destruction of the Corpus Luysii or of its Descending Fibres.

A study of the foregoing cases in more detail than it is possible to give them here enables us provisionally to attribute a group of symptoms to the destruction of the corpus Luysii or interruption of its descending fibres, with the consequent release or disturbance of the function of other structures. The chief symptom is a violent chorea of the opposite side of the body, with unusual involvement of the shoulder and hip, and, therefore, with movements of unusual amplitude. The affection of the face, according to nearly all the descriptions, is less than one would expect from the amount of choreic movement in the limbs. Speech, swallowing, and respiration are all involved in the chorea. The movements cease entirely during sleep. The tendon-jerks of the affected side are usually less than those of the other, indicating a moderate degree of hypotonia.

In a number of cases it is recorded that the temperature of the choreic side was higher than that of the other half of the body, and in my case there was some unilateral sweating.

In nearly every case there has been a mental disturbance—at first chiefly an emotional change (excessive anxiety), and afterwards loss of memory, confusion, and disorientation.

There are no signs of pyramidal disease, no loss of superficial sensation or of sense of position, no defects in the pointing tests.

In all the recorded cases in which the syndrome was fully developed death has resulted in a few weeks, the maximum duration of life recorded after a sudden onset of violent chorea being eight weeks (Greiff). But with less severe symptoms the period of survival may be very much longer. In all the cases in which the mode of death can be ascertained, except Bonhoeffer's case in which death was due to erysipelas, the patients died of broncho-pneumonia. Touche's patient, who lived for a year after the onset of the chorea, had three attacks of broncho-pneumonia during that time. It is remarkable that none of the patients died of cerebral hæmorrhage or of cardiac failure. I think that the tendency to broncho-pneumonia is possibly to be correlated with the respiratory disturbances of the chorea and to be included as part of the fully expressed syndrome.

Remarks on the Pathogenesis of Chorea.

Since chorea commonly occurs in association with widespread inflammatory or degenerative changes in the brain, it has perhaps not been generally realised that it might result from a focal lesion. In this paper no reference is made to the inflammatory or degenerative choreas, but we must ask ourselves in what way focal lesions in the situations we have described can result in chorea. It is now generally conceded that chorea is a "release phenomenon," i.e. that it arises from the excessive or irregular activity of intact structures from which a controlling or guiding influence has been withdrawn. The cases that have been related do not indicate in what structures the impulses arise which originate the choreic movements, nor what structures must be intact in order that chorea may occur. Two factors indicate, however, that the impulses arise at a lower level than the body of Luys and that the controlling influence over them is normally exerted by the body of Luys itself. In the first place, we are dealing with a descending anatomical system of fibres; fibres arise in the lenticular nucleus and pass to the body of Luys, and another set of fibres arising in the body of Luys continues the path downwards to the mid-brain. Such a system must, by reason of its anatomical arrangement, exert its action downwards; in other words, the control which the destruction of Luys's body apparently interrupts is a downward-directed control, and so the impulses over which it is normally exerted must be arising at a lower level. Secondly, there is no valid evidence that focal injuries above the body of Luys result in chorea. Numerous animal experiments have been performed, of which those of Kinnier Wilson[8] on the lenticular nucleus and the recent series by Delmas-Marsalet[9] on the caudate may be mentioned, and in no instance has chorea or any symptom comparable to chorea resulted from a lesion of these structures. Of clinical cases of pure chorea resulting from focal lesions nearly all the recorded instances have already been mentioned. It is true that there remain four—those of Vogt,[10] Conos,[11] Austregesilo and Gallotti,[12] and Fragnito and Scarpini[13]—and that in all of these the chorea has been attributed to a lesion in the caudate or putamen. But it can be said without fear of contradiction that as a basis of argument the first three of these are valueless. The fourth is a much more important record, but is open to certain objections, and the authors, who express themselves with great reserve on its merits, state definitely that they are unwilling to give any general application to their findings. Consequently we must for the present be guided by the experimental evidence and assume that focal lesions of the caudate or lenticular nucleus do not give rise to chorea. If chorea does not occur unless the lesion is as low in the system as the corpus Luysii, and does occur when that structure is damaged, the control which normally prevents chorea must be exerted by the corpus Luysii itself. As long as that primary control is intact, chorea from a focal lesion does not seem to occur.

Physiological Action of the Corpus Luysii.

Of the physiological action of the corpus Luysii little can yet be said, except that it exerts a control over impulses arising in certain lower structures which are probably situated in the mid-brain. There is no unanimity as to the nature of the impulses which cause chorea, and until we know their nature we cannot deduce the normal function of the corpus Luysii from the *symptoms* liberated by its destruction. The anatomical connexions of the corpus Luysii with the lenticular nucleus suggest that there is a higher control of its activities represented in certain cells widespread in the striatum and pallidum, and it may be that by these nuclei the function of Luys's body is normally directed in relation with other cerebral functions.

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A NOTTINGHAMSHIRE ORTHOPÆDIC HOSPITAL.—The Duke of Portland has given a large site at Harlow Wood, near Mansfield, for the erection of an orthopædic hospital. Owing to legal difficulties a public Guarantee Company has been formed for its erection. Last year, in Nottingham alone, there were more than 100 cripples for whom treatment was not available.

A CLINICAL STUDY OF THE HUMAN AND BOVINE TYPES OF TUBERCULOSIS IN MAN.

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The investigations out of which this paper developed were originally undertaken by Prof. J. M. Beattie, of the University of Liverpool, to determine whether the incidence of human and bovine tuberculosis was the same in Liverpool as in other parts of the country. The bacteriological work has all been carried out by him from clinical material supplied from the City Sanatoria, the Royal Liverpool Children's Hospital, the Liverpool Stanley Hospital, and private practice. It is therefore fairly representative of all types of non-pulmonary tuberculosis and of various ages and social strata. The correlation of the clinical conditions with the bacteriological findings brought out many points of interest which are important in so far as they contribute to a more accurate knowledge of the disease. My conclusions should be regarded as indications rather than demonstrations of the truth. So far as they go, I think they are justified by ascertained facts, but larger numbers are needed before generalisations can be made. Of necessity a certain amount of selection has crept in. The material is from consecutive cases, but since, as a rule, it is the more hopeful cases that reach the operating-theatre the mortality results are of no absolute value. On the other hand, a certain amount of comparison between different groups is permissible.

One hundred cases were investigated bacteriologically during the years 1923–24–25. One or two have been excluded as certainly not tuberculous. Some patients cannot be traced, and so final conclusions cannot be drawn about them, although previous notes render them useful for certain statistics.

Inoculation Failures.

A considerable number of cases inoculated, although clinically undoubted cases of tuberculosis, gave no result in the test animals. Of these "negative" results one should be eliminated, as the patient had a severe streptococcal infection and the animals died of streptococcal septicæmia. This leaves 31 cases, almost one-third, for inquiry. The material used in these 31 cases was: in 66 per cent. the caseous debris of softening glands or actual pus; in 25 per cent. caseating bone foci; and peritoneal fluid and tuberculous granulation tissue in 4 per cent. each. As the proportions are practically identical in the series of cases proved definitely bovine, it seems that the source of the material and its physical properties have no important bearing on its failure to produce disease in animals. In other words, although pus was used in a considerable percentage of cases—and tuberculous pus is notoriously deficient in tubercle bacilli—the negative results cannot be attributed to this factor, as pus was used in just as many cases which gave positive results. So far as it goes, this is an argument against the criticism that paucity of organisms in the material used was responsible for the absence of tuberculosis in the laboratory animals.

It may be said that such organisms as were present were enfeebled by exposure to powerfully antagonistic bodies in the serum of patients highly immunised against tuberculosis. If this be so, the high state of immunity is not reflected in the clinical progress of the patients. In those under consideration the recovery-rate (or proportion of apparent cures) was only 73 per cent. None of the 18 cases of undoubted bovine tuberculosis traced for two years or over showed any signs of active disease—i.e., the recovery-rate was 100 per cent. I do not think that the effects of general immunity in the patient are of any great importance here. On the other hand, local conditions seem to have a bearing upon the results. It is conceivable that fibrosis, for instance, is inimical to the organisms in lesions in one part of the body, while in other parts the disease might even be progressive. The average duration of the lesion in the cases giving "no result" was 4·3 years (though several cases had apparently relatively short histories), while the "human" cases had lasted 2·3 years and the "bovines" only just over one year. That the results were not merely fortuitous is shown by the fact that repetition of the inoculations confirmed the original negative finding in several instances.

In case it should be pleaded that these patients were not tuberculous at all, those in whom any clinical doubt arose have been excluded. The proportion of cases of actinomycosis and syphilis which simulate tuberculosis is very small. No case giving a positive Wassermann reaction has been included. The table shows that, in the distribution of the disease over the different organs and systems, the "no result" cases represent almost exactly the average between those of definitely human and bovine origin. The negative cases, therefore, are probably derived fairly equally from both types of infections, so that it cannot be said that one type of bacillus is more frequently at fault, or is more easily influenced by the local curative actions of the body, than the other. For this reason the "no result" cases have been ignored in the statistical inquiries into the human and bovine cases.

—	Bovine.	Human.	No result.
Lymph glands	25	11	20
Bones and joints	5	13	7
Abdomen	2	0	2
Genito-urinary	1	1	0
Miscellaneous	1	1	1

Regional Distribution.

The bovine bacillus is found to account for 75 per cent. of the cases of tuberculous glands in the neck. That is rather less than has been found in certain other districts, where the percentage has been placed as high as 90 per cent.[1] Inquiry into the age incidence may account for this apparent variation. Bovine infections were present in only about 28 per cent. of the bone cases. The figures relating to abdominal and genito-urinary cases—mainly because they are relatively seldom submitted to operation—are so small as to be valueless. In the main the figures are comparable to those for the country generally.

A study of the age factor throughout the whole series shows that 65 per cent. of the human infections were over 12 at the age of apparent onset, while 35 per cent. were 20 or over when symptoms first appeared. Among the bovine cases, on the other hand, only 15 per cent. were over 12 when attention was drawn to the disease. Of these 15 per cent., although the infection was bovine, three out of the five were not only over 12 but actually between 20 and 25 when evidence of tuberculosis was first obtained. While, roughly, 75 per cent. of all bone tuberculosis is due to the human bacillus, in patients over 15 the figure rises to 82 per cent., and in those under 15 about 70 per cent. is human in origin. This figure is one of great significance.

Of the cases of lymphatic gland infection in children 16 per cent. yielded the human type of organism and 84 per cent. the bovine. This more closely approximates to the 90 per cent. quoted above from the published results of work done entirely amongst children. Nevertheless, the fact remains that in Liverpool 16 per cent. of cases of glandular tuberculosis are due to human bacilli—i.e., infection from active cases of phthisis. In contrast to this 62 per cent.

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[1] A. P. Mitchell: Infection of Children with Bovine Tubercle Bacillus, Brit. Med. Jour., 1914, i., 125.

of glandular disease in adults is due to the human tubercle bacillus. In fact, in adults about 72 per cent. of all surgical tuberculosis is the result of infection with the human organism. That implies that a very large proportion of cases of adult non-pulmonary tuberculosis have also a pulmonary focus —active or latent. This should increase the gravity of the prognosis in these cases, should make prolonged after-care imperative, and should be a warning against the indiscriminate use of general anæsthetics, which may aggravate pulmonary disease. An X ray of the chest should always be taken before operation on any adult with surgical tuberculosis.

Family History.

It was thought that a study of the family history would in many instances give a clue to the type of disease present—i.e., that a history of phthisis in a member of the older generation would be found in infections with the human bacillus, and that in bovine infections the older generation would be healthy, and other members of the same generation diseased. Here, however, great difficulties are encountered. There is a very widespread feeling that it is disgraceful to have a case of tuberculosis in the family. Unfortunately, the sense of disgrace does not lead to the general adoption of a more hygienic way of life, the use of non-tuberculous milk, and stricter measures to prevent the spread of infection, but only to concealing the shameful fact or to heaping up mounds of sand in which to bury the head, so that at least the horrid thing is out of sight. Infection of collateral members of the family is surprisingly seldom reported in bovine infections, though, of course, striking instances do occur. This is another indication that the soil is at least as important as the seed in the development of tuberculosis. In human cases, on the contrary, a bad or decidedly suspicious history of pulmonary disease was found in 31 per cent. Over and over again one can elicit nothing more than "grandmother always had a cough and mother died of pneumonia."

Apart from a study of the family history, attempts at determining the portal of entry were singularly unsuccessful. It was definitely recorded that, among the bovine cases, two apparently originated in glands draining the area in which an open wound had existed a short time before. In bovine cases the milk naturally falls under special suspicion. In four cases, one of which was in a well-to-do intelligent family, it was stated that the milk had always been boiled. This, of course, proves nothing, for such matters are often left to maids, who may be untrustworthy. Moreover, other articles of diet, such as butter and cream, may be carriers of the bacillus. The tonsils were diseased and the teeth carious in many patients with cervical glandular disease, but in several others they were not obviously at fault. Little weight, unfortunately, can be attached to this observation as, apart from the possibility of tuberculous infection passing through a tonsil without leaving indisputable evidence behind, it has been definitely shown that naked-eye examination is no criterion as to the presence or absence of actual tuberculous disease in a tonsil.[1]

Results of Treatment.

The results of treatment are strikingly different in the different groups. For instance, as already stated, all the 18 bovine cases traced were found in good health, and their lesions quiescent, while no less than 18·75 per cent. of the human cases were dead within three years; 68·75 per cent. were cured or apparently cured. I do not think this necessarily means that the bovine infections are harmless, while the human are deadly. Apart from the long period of illness, the expense of treatment, and the permanent crippling often caused by bovine infections, many patients die in the early years of life from meningeal, pulmonary, and abdominal tuberculosis, and are never seen by the surgeon.[2] The course of the two infections is apparently very different. Those due to the bovine organism begin, as a rule, early in life, though not necessarily in the very earliest years, and may lead to a comparatively acute and virulent process. Should this not prove fatal, the manifestations of the disease become more and more chronic until after early adult life it practically disappears. Many believe that the human infection is contracted early—i.e., within the first four years of life—and that thereafter, if not rapidly fatal, it lies latent, perhaps for many years. Be that as it may, in "surgical cases" the disease is one that tends to attack those of maturer years (65 per cent. over 12 at the time of apparent onset) and, unlike the bovine type, it never disappears, and all ages are liable to suffer. It may become very chronic, but the immunity established evidently falls far short of that produced by the bovine organism, as is shown by the very considerable mortality in the human variety.

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[2] Dr. Louis Cobbett's evidence, Report of Royal Commission on Tuberculosis, 1907.

SOURCES OF INFECTION IN NON-PULMONARY TUBERCULOSIS.

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For the past seven years I have noted, from the reports of our sanitary inspectors on cases of non-pulmonary tuberculosis, whether there was a history of exposure of the patient to a pulmonary case occurring in the patient's family. In all these patients there is a considerable presumption that the infection was of human origin. The total number of cases so examined is now 4469, and these are presented in Table I., separated according to the anatomical site, on the usual classification. The numbers are sufficiently large to have some statistical validity.

TABLE I.

City of Liverpool.—Cases of non-pulmonary tuberculosis in 1921–27, divided into Group A—*those with no history of exposure, and Group B—those with a history of exposure to open cases of tuberculosis occurring within the family of the patient.*

Site of disease.	A.—No exposure.	B.—Exposure.	Proportion of total expressed per cent.		Difference of percentage.*	Probable error of difference (per cent.).
			A.	B.		
Bones and joints ..	974	89	24·3	19·3	−5·0	±0·41
Abdominal	859	116	21·4	25·1	+3·7	±0·45
Peripheral glands ..	1277	156	31·9	33·8	+1·9	±0·49
Meninges and brain	418	61	10·4	13·2	+2·8	±0·39
Skin..	124	15	3·1	3·2	+0·1	±0·80
Urinogenital ..	92	3	2·3	0·7	−1·6	±0·97
Other, or ill-defined	264	21	6·5	4·6	−1·9	±0·32
Total	4008	461	99·9	99·9	—	—

* This column gives the excess (or defect) of the percentage of cases occurring in Group B over the percentage of cases occurring in Group A.

The significance of these figures lies in the last two columns, which give (1) the excess or deficiency of the percentage of cases having a history of exposure to infection in comparison with the percentage of cases having no such history, and (2) the probable error of this difference in percentage. The usual criterion of the significance of a difference of two rates is that it should be three or more times its probable error. With this proviso the following deductions may be made from the table. In Liverpool—

1. Tuberculosis of the bones and joints is significantly more frequent in those having no history of exposure to a human source of infection.
2. Tuberculosis of meninges and abdominal tuberculosis are significantly more frequent in those having a history of exposure.

3. Tuberculosis of peripheral glands is significantly in excess in those known to be exposed to human infection, but the significance is not so high as in 1 and 2.

4. The other groups either lack precision or are not numerous enough to be significant.

The deductions from these figures indicate that tuberculosis of bones and joints is more often of bovine origin than meningeal, abdominal, or, with less certainty, peripheral glandular tuberculosis. This inference is somewhat contrary to the usual opinions which are based largely on the work of Eastwood and Griffith, and of Park and Krumwiede. Griffith has given figures of cases bacteriologically investigated; they indicate that 46·5 per cent. of cervical glandular cases, 41·3 per cent. of abdominal cases, and 18·3 per cent. of bone and joint cases occurring in children were caused by bovine bacilli.

I give now a table (II.) of non-pulmonary cases of tuberculosis, slightly modified from figures given by Dr. A. S. Griffith at the National Milk Conference in London in 1922. I have computed the probable errors of the percentage.

TABLE II.*

—	Cases.	Bovine and per cent.	Probable error.
Cervical glands	116	54 (46·5)	±3·12
Bone and joint	476	87 (18·3)	±1·20
Lupus	126	64 (50·8)	±3·00
Genito-urinary	17	3 (17·6)	±6·23
Post-mortem material ..	159	39 (24·5)	±2·30
Meningitis	12	2 (16·6)	±7·25
Total	906	249 (25·8)	±0·95

* These figures, unfortunately, do not give the abdominal cases.

Owing to their numerical insufficiency the figures of bacteriological examination of material from cases of non-pulmonary tuberculosis are not beyond statistical criticism, despite the immense labour involved in obtaining them. Mr. E. D. Rudolf[1] performed this task some years ago, and his results are given in Table III.

TABLE III.

Age-period in years.	Total cases.	Bovine infections and per cent.	Maximum variation possible.
0–5	47	14 (29·79)	18·87
5–10	108	31 (28·71)	12·31
10–16	62	7 (11·29)	11·37
16–25	15	3 (20·0)	29·2
Over 25	29	0 (0·0)	0·0
Total	261	55	—

It appears from these figures that the number of cases occurring in persons over 16 years of age is insufficient for comparison, and the figures in this respect are not a fair sample of the population. In order, then, to make a useful comparison it is necessary to confine attention to children. The figures given in Table IV., from information provided by Dr. B. T. J. Glover, show the distribution into adults (over 15 years) and children, of 2625 cases on the records of the tuberculosis dispensaries in 1927, and are probably a fair sample of the whole.

TABLE IV.

Cases of non-pulmonary tuberculosis among persons on records of tuberculosis dispensaries in Liverpool, 1921–27.

Classification.	Adults and per cent.	Children and per cent.	Total.	Children. Per cent. of total at site.
Bones and joints	277 (36·40)	469 (25·16)	746	72·6
Abdominal ..	83 (10·91)	471 (25·27)	554	85·0
Peripheral glands	314 (41·26)	764 (40·99)	1078	70·9
Other	87 (11·43)	160 (8·58)	247	64·8
Total	761 (100·00)	1864 (100·00)	2625	71·1

The incidence upon adults and children is not markedly different except in the case of abdominal tuberculosis, which is predominantly a disease of children, and to a lesser degree in respect of bone and joint tuberculosis which has a somewhat disproportionate incidence upon adults. I therefore returned to my records and abstracted the cases with a history of exposure, dividing them into adults and children. The result is shown in Table V.

TABLE V.

Cases with a history of contact with a pulmonary case.

Classification.	Adults and per cent.	Children and per cent.	Total.	Ratio of children to adults (per cent.).
Bones and joints	24 (22·64)	65 (18·31)	89	2·7
Abdominal ..	10 (9·48)	106 (29·86)	116	10·6
Peripheral glands	51 (48·11)	105 (29·58)	156	2·0
Other	21 (19·81)	79 (22·25)	97	2·8
Total	106 (99·99)	355 (100·00)	458	3·31

It would take too long to find the proportion of children in all the cases of non-pulmonary tuberculosis, and so I take the records of the tuberculosis institutes, in which the children amount to 2625 out of 4469, or more than half the total, and, with this proportion as a basis, eliminate from the total given in Table I. the proportion which may be regarded as probably adults (Table VI.).

TABLE VI.

Estimated cases of non-pulmonary tuberculosis *in children* in the City of Liverpool during 1921–27, divided into (A) those with *no* history of exposure, and (B) those with a history of exposure to a pulmonary case of tuberculosis.

Site of disease.	A.—No exposure.	B.—Exposure.	Proportion of total expressed per cent. A.	Proportion of total expressed per cent. B.	Difference of percentage.*	Probable error of difference (per cent.).
Bones and joints ..	772	65	24·18 ±1·01	18·31 ±1·38	−5·87	±1·71
Abdominal	829	106	25·97 ±1·05	29·86 ±1·64	+3·89	±1·95
Peripheral glands ..	945	105	29·60 ±1·09	29·58 ±1·63	−0·02	±1·96
Other, or ill-defined	646	79	20·24 ±0·96	22·25 ±1·49	+1·01	±1·77
Total	3192	355	99·99	100·00	—	—

The deductions from Table I. have to be somewhat modified for children:—

1. Bone and joint tuberculosis is significantly in excess in those having *no* history of exposure to human infection.

2. Abdominal tuberculosis is in slight excess in those having a history of exposure.

3. Peripheral glandular tuberculosis occurs with as high a frequency among those exposed as among those not known to be exposed to human infection.

There is therefore a direct contradiction between the figures I now publish and the results of bacteriological investigation. Possibly the discrepancy arises from differences in the age-distributions of the populations investigated; or there may be geographical differences; or the cases bacteriologically investigated may be representative of only a portion of the whole—e.g., the more severe cases.

It is of some interest to note that, although the collection of the data has occupied seven years, their analysis has taken only two days; yet it is this comparatively slight labour which is usually shirked. Use has been made of Pearson's tables for the value of χ, Miner's tables of $\sqrt{pq}$, Barlow's tables of squares, and a calculating machine for the multiplication and division.

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[1] THE LANCET, 1922, i., 1146.

I have to express my thanks to Dr. A. A. Mussen, Medical Officer of Health for the City of Liverpool, for permission to publish these figures.

THE PERMANENCE OF THE SCHICK NEGATIVE STATE.

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AND

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It is customary to assume that the state of immunity to diphtheria which is indicated by a negative Schick test is permanent. This is suggested by much experimental work on the duration of active immunity, but, because modern methods of diphtheria prevention are of such recent date, it is impossible to examine the expectation by actual experience in human beings. This paper records the results of retesting children at intervals after a negative Schick test was obtained, the maximum interval being seven years. An investigation has also been made of the capacity of response to artificial immunisation of any who may have become positive after having once been negative. 973 children were retested one to seven years after the first negative Schick test. All were negative with the exception of 28 (2·9 per cent.). 541 children were retested after one to three years, 191 after three to five years, and 241 after five to seven years. After one to three years the percentage of positives was 2·6, after three to five years 5·3, and after five to seven years 1·7, differences which are probably not significant.

The 973 children may be subdivided into two groups—viz., 533, who were negative to the original Schick test one to seven years previously, and 440, who were positive on the original Schick test and became negative only after injections of prophylactic mixtures (vide table). 527 children (98·9 per cent.) of the 533 who were negative on the original Schick test one to seven years previously were read as negative on retest, and 6 (1·1 per cent.) as positive. 418 (95 per cent.) of the 440 in the immunised group were negative on retest and 22 (5 per cent.) were positive. It will be seen that there is little difference in the Schick-positive rate of the two groups. Further tests may, however, confirm the observation that children who have been immunised by artificial methods show a somewhat higher percentage of positives on retest than those who have become immune in response to the weaker stimuli which they may receive naturally. It may be possible that some individuals can be immunised only by the larger stimuli introduced in prophylactic mixtures, and that these people are prone to lose some of the antitoxin they may thus with difficulty acquire. One or two individuals who gave faint reactions may have been wrongly read as positive in our recent retesting, but it is better to read as positive one or two doubtful reactors who are really immune than to pass as Schick-negative a susceptible subject. The Schick level of immunity corresponds to about 1/100th to 1/30th of a unit of antitoxin per c.cm. of blood. The Schick-negative reactor contains more than this amount and the Schick-positive reactor less.

Group 1.—533 Children Negative on Original Test.

In six children who were originally Schick-negative one to seven years previously a positive Schick result was obtained, indicating a quantity of antitoxin less than 1/50th of a unit per c.cm., but four of the six became negative within a brief interval of the Schick test injection. Thus, two weeks after the Schick test was made, a blood sample from one child was examined and found to contain half a unit per c.cm. Blood samples from two other children contained 1/10th unit of antitoxin per c.cm. within one week of the Schick injection, and a fourth child had 1/100th unit in two weeks and gave a Schick-negative reaction in three weeks. Only 2 (0·4 per cent.) of the children (italics in table) required an injection of an immunising mixture. One had no detectable antitoxin in seven days, was given an immunising injection of toxoid-antitoxin at 14 days, had 1/100th unit at 21 days, and was definitely negative a fortnight later. The other gave a positive reaction to a second re-Schick one week after the first, had less than 1/1000th unit of antitoxin, and was given 1·0 c.cm. of an immunising mixture after two weeks and had 1/250th unit of antitoxin in four weeks. This child has recently had another 1·0 c.cm. dose of a prophylactic mixture and is still under observation.

The first four cases afford a parallel to the experiments of Glenny and Allen (1922) on rabbits and guinea-pigs; they found that even 1/20th of a Schick test dose might act as a "secondary stimulus" (Glenny and Sudmersen, 1921), causing a rapid production of antitoxin in an animal which had once been actively immune but which had subsequently lost some or all of its circulating antitoxin. The present investigations have amply confirmed Glenny's observations, and there is no room for doubt that such a small amount of toxin as 1/50th of the guinea-pig minimal lethal dose has a pronounced influence on the amount of circulating antitoxin actively produced, even of such a large animal as a human being. This point has already been discussed by O'Brien (1926), who instanced six cases in which a Schick test dose produced a demonstrable rise in antitoxin in actively immune subjects. Similar observations have been made by Kellogg and Stevens (1927).

Group 2.—440 Children Positive on Original Test and Negative immediately after Immunisation.

Twenty-two children (5 per cent.) in this group were positive on retest one to seven years later, but, as in the first series, all but 2 (0·4 per cent.) developed antitoxin rapidly in response to the stimuli of Schick injections. It will be seen from the table that five of the children were still positive or partially positive on a second re-Schick in the second or third weeks, but one week later all five had 1/25th to 1/5th unit of antitoxin. Two reactors who were more refractory (italics in table) were a brother and sister at a poor-law institution who had been very difficult to immunise in 1925. They had both required two courses of diphtheria prophylactic mixture—six injections of 1·0 c.cm. in all—but were, we think, undoubtedly Schick-negative finally, the boy within two months and the girl within four months of the last immunising injection. We are confident that the toxin dilutions with which these tests were made were of satisfactory potency on both occasions. On retest three years later both children were positive, and after one week and four weeks had no detectable antitoxin in the blood (i.e., less than 1/2000th unit per c.cm.). Schick tests in the first and fourth weeks were also positive. In the fifth week they were given 1 c.cm. of toxoid-antitoxin mixture. Two weeks later the boy had 1/25th unit of antitoxin, indicating a fairly brisk response, but his sister still remained refractory and is receiving further injections.

Discussion.

It will be seen that there is very little difference between the two groups, which can now be considered together for purposes of discussion. At first sight the percentage of children who had reverted to the Schick-positive state after having once been negative is disquieting; 28 children (2·9 per cent.) of 973 who had been read as negative one to seven years previously were regarded as positive on retest. It is, however, reassuring that only four children (0·4 per cent.) required immunising injections, and that three of the four showed a marked rise in antitoxin within one to three weeks of a single dose of prophylactic mixture. It is doubtful, therefore, if the immunising mechanism of these children would really have been sluggish vis-à-vis an average infecting dose of virulent organisms. The fourth child (0·1 per cent. of the entire series) is in a different category, for she failed to show the slightest response to an injection of 1·0 c.cm. of toxoid-antitoxin mixture.

The efficiency of the Schick dose of toxin as a "secondary stimulus" is remarkable. It is a very small amount of toxin, originally founded on 1/50th of the guinea-pig minimum lethal dose, and in combining power is equivalent to 1/1000th of a unit.

of antitoxin. If, however, a Schick-negative reactor has lost some of his antitoxin and becomes Schick-positive, with little or no detectable antitoxin, the Schick dose of toxin may be sufficient to make him once again Schick-negative. In other words, active immunity with the capacity for responding to a fresh stimulus has remained, although circulating antitoxin may have been lost. The fact that a Schick dose of toxin may be capable of stimulating the production of circulating antitoxin in an actively immune subject must be borne in mind in connexion with every type of experiment, in animals as well as in human beings, in which serial Schick tests are used for the study of changes in immunity.

Over and above the series under review we have retested a group of 194 children who were negative on the original test three months previously. All were negative on retest.

The observations, so far as they go, while not completely establishing the dictum "once Schick-negative, always Schick-negative," support the more general statement "once immune, always immune," if by immunity we imply a more ready protective response to the invasion of the specific toxin. One would expect such a "potential" immunity to be sufficient to protect an individual against any serious infection by the diphtheria bacillus.

Tests on 973 Children.

After 1–7 years : re-Schick.			Weeks after re-Schick.					
			1	*2*	*3*	*4*	*5*	*7*
533 children negative on original Schick test.	−527 (98·9%)	1	..	1/2*	..	..	..	..
		2	1/10	..	..	..	..	..
	+6 (1·1%)	1	..	1/100	−	..	..	..
		1	Nil	M	1/100	..	−	..
		1	+	1/1000 M	..	1/250	(a)	..
440 children positive on original Schick test and negative immediately after immunisation.	−418 (95·0%)	2	1/2	..	..	..	..	..
		1	1/50	1/25	1	..	..	..
		2	1/100	..	..	1/25	..	..
		1	1/100	−	..	..	..	..
		1	..	1/100	−	..	..	..
		2	..	1/100	±	1/25	..	..
		2	1/250	1/50	..	..	..	..
		1	1/250	..	−	..	..	..
		1	..	1/250 +	1/5	..	..	..
	+22 (5·0%)	1	1/500	..	..	1/50	..	..
		2	..	1/750 +	1/5	..	..	..
		1	1/1000	..	−	1/25	..	..
		1	−	..	..	..	..	..
		2	+	−	..	..	..	..
		1	Nil +	..	..	Nil +	M	1/25
		1	Nil +	..	..	Nil +	M	Nil (a)

* = Half a unit of antitoxin per c.cm. of patient's blood.
(a) Further details incomplete.
M = Toxoid antitoxin mixture—1·0 c.cm.
+, ±, −, = Reaction to Schick test.

Summary.

(1) 533 children who were Schick-negative on the original test were retested one to seven years later, and showed a 1·1 per cent. Schick-positive rate.

(2) 440 children who were Schick-positive on the original test were rendered Schick-negative by immunisation. When retested one to seven years later 5 per cent. were found to be positive.

(3) In both these groups nearly all the "relapsed" Schick-positive individuals rapidly produced circulating antitoxin in response to very small amounts of diphtheria toxin, and could be considered as in a state of active immunity.

We have to thank Mr. A. T. Glenny for valuable help and advice as well as for the numerous blood titrations which he has kindly done for us.

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THE SCREENED RADON SEED IN THE TREATMENT OF MALIGNANT DISEASE.

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FOR many years attempts have been made to treat tumours by implanting into them small pieces of capillary glass tubing containing radium emanation, but the results of such treatment have been unsatisfactory owing to the necrosis induced by this method, the glass capsule allowing the very destructive β rays to pass into the surrounding tissues.

The use of a capillary seed enclosed in a metal case having attached to it a fine thread has only recently been adopted in this country, though the method has been extensively used in America, particularly by Dr. Joseph Muir, of New York. No statistics of value can yet be given from a series of patients treated with seeds at the Radium Institute, London, but the results which are being obtained are encouraging, more especially in those cases which past experience has shown respond poorly to other forms of radium therapy. The object of this paper is to indicate the type of case most likely to derive benefit from this particular method of radiation and to give a brief description of the apparatus employed at this Institute.

Apparatus.—The seeds are cylindrical shells of platinum tapered at both ends, encasing a piece of capillary glass tubing containing radium emanation. Each seed is 6 mm. long and 1·1 mm. in diameter, having a wall of 0·3 mm. of platinum. Attached to the seed is a fine black thread which serves the dual purpose of marking the position of the seed in the tumour and facilitating its removal when the required dose has been given.

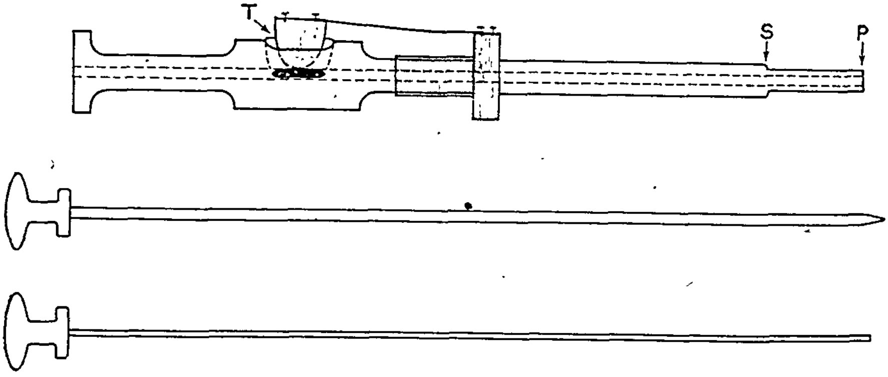
Dosage.—The majority of the patients have been treated with seeds each containing 1·5 millicuries of radon at the time of implanting, giving 200 millicurie hours of radiation if left in the tumour 14 days, by which time its radio-activity is negligible. The platinum screen 0·3 mm. in thickness allows about 90 per cent. of the gamma rays to pass through with less than 5 per cent. of beta rays.

Technique.—A trocar, with a special cannula as shown in the diagram, is used for implanting the seeds. The instrument having been loaded with a seed through the slot T it is inserted into the tumour up to the shoulder S. On withdrawal of the trocar the seed is forced into the lumen of the cannula by the spring and may then be pushed into the tissues with the stilette. It is a point of importance that the use of "introducers" with known but varying lengths from point P to shoulder S, enables the operator to plant seeds at known depths from the surface. As a general rule the seeds in a tumour should be about 2 cm. apart. Seeds may be implanted into tumours of the bladder through an operating cystoscope, using flexible introducers, and special instruments have been devised for use through the œsophagoscope and the proctoscope.

After-treatment.—The threads of seeds introduced anywhere in the buccal cavity may be bunched together, brought out through the mouth, and fixed to the skin of the cheek with adhesive plaster. Experience has shown, however, that patients tolerate the presence of the threads better if they are cut short (½ inch) and left free. While it is customary to remove the seed by gentle traction on the attached thread when its period of activity is over, no ill-effects have been noted in cases where the seeds have been left permanently in the tissues.

Advantages of the Method.

The advantages of seeds over other forms of radium applicators are: 1. By suitable spacing of the seeds throughout the whole tumour a uniform radiation is obtained. 2. The seeds are easily introduced and can be accurately placed in position. 3. Owing to their small size they are retained at the required site. This is of particular advantage in regions where the soft tissues are scanty—e.g., the alveolar margin. 4. Screened seeds without threads may be used in the treatment of tumours from which the recovery of radium needles would be difficult. 5. Patients are not confined to bed throughout treatment, but are able to attend as out-patients for regular examination. 6. Some hours after the insertion of radium needles into tumours of the tongue, for example, it is a common experience to find the heads of the needles becoming exposed, however completely they may have been buried at the time of operation. This is probably due in part to the movement of the tongue and in part to the traction of the heavy silk threads attached. Burns of the mucous membrane of the buccal cavity are likely to result unless special shields covering the alveolar margins and cheeks are employed. Seeds by remaining completely embedded in the tissues minimise the risk of burns and make the use of the cumbersome screens unnecessary. 7. Trauma is minimised, the seed causing little damage to the tissues both at the time of insertion and removal, owing to its size and shape. This is an important factor when dealing with malignant disease.



Cannula, trocar, and stilette, used for implanting radon seeds.

Types of Cases most Suitable for Seed Treatment.

While most malignant tumours may be treated as satisfactorily with seeds as with other forms of apparatus, their use at the Radium Institute has been confined to tumours which, owing to their position, would not receive uniform radiation by other methods.

These may be divided into two main groups. In the first are placed tumours where the retention of radium needles is difficult owing to the constant and unavoidable movement of the structures or to the small amount of soft tissue present. Examples of such tumours are those of the palate, the floor of the mouth, gums, frænum of the tongue, mucous membrane lining the cheek, tonsil, larynx, and pyriform fossa. Into regions such as these it was customary to insert comparatively large doses of radium to act for a short time. This method gave non-uniform radiation, sometimes followed by severe reaction and sloughing. Seed treatment of such patients gives them the triple advantage of a minimum of discomfort, uniform radiation, and a comparatively small dose of radium acting over a period of many days.

Into the second group may be placed tumours whose inaccessibility makes both the inserting and recovering of radium needles a difficult and frequently hazardous undertaking. It is unnecessary to give a list of these tumours which would include such commonly occurring ones as carcinoma of the œsophagus, stomach, prostate, rectum, and bladder. By employing suitable introducers radon seeds may be implanted into most of these, thus ensuring their complete radiation.

Mention must also be made of the suitability of seeds for the treatment of small malignant nodules. The small size of the seed enables it to be completely embedded at the site required. Needles inserted into such nodules frequently cause damage to the surrounding tissues which receive rays from the projecting ends, while small surface applicators are unlikely to remain in the required position for prolonged periods.

While this paper has been devoted to the description of treatment with seeds alone, we have frequently found them of use in conjunction with other forms of radium apparatus.

Illustrative Cases.

The following cases, in which the diagnosis has been confirmed by section, illustrate the results which are being obtained after treatment of the primary lesion with radon seeds.

CASE 1.—*Surface epithelioma,* with little surrounding healthy tissue. Male, aged 61, Treated June 19th, 1928. Fungating epithelioma of the right ear. 3·0 cm. in diameter, growing for two years. Four seeds were inserted into the tumour and left there for six days. Present condition: tumour no longer present, ulcer healed.

CASE 2. *Carcinoma; floor of mouth.*—Male, aged 59. Treated in May, 1928. Patient had a malignant ulcer of the floor of the mouth, which had been noticed for about three months. The ulcer, which had hard edges, extended from the mid-line, backwards beneath the tongue on the left side for about 4 cm. Ten seeds were inserted and allowed to remain for seven days. Present condition: ulcer is completely healed. Movements of the tongue are free.

CASE 3. *Carcinoma of alveolar margin.*—Male, aged 70. Treated January, 1928. Patient had been unable to wear his lower denture during the latter part of 1927. He was found to have a hard, coarsely papillated carcinoma on the alveolar margin of the right lower jaw. Four seeds were inserted for 14 days. On examination in March active disease was noted at each end of the area treated on his first attendance. Four seeds were again inserted. Present condition: a smooth white scar, soundly healed.

CASE 4. *Carcinoma; frenum of the tongue.*—Male, aged 56. Treated March, 1928. This patient had a large carcinomatous ulcer in the mid-line beneath the anterior part of the tongue, spreading on to the floor of the mouth and on to the alveolar ridge. Nine seeds were inserted for ten days. Present condition: soundly healed, no sign of disease.

CASE 5. *Epithelioma of mucous membrane lining the cheek.*—Male, aged 70. Treated April, 1928. Patient had a soft plaque with a velvet-like surface on the buccal mucous membrane of the right side of the mouth. The diseased area was 3·0 by 2·0 cm. in size with little surrounding infiltration. Six seeds were inserted for ten days. Present condition: no evidence of disease.

CASE 6. *Epithelioma of mucous membrane of cheek and gum.*—Male, aged 84. Treated January, 1928. On examination this patient was found to have a malignant ulcer with indurated edges and base, involving the right alveolar ridge and spreading on to the mucous membrane of the right cheek. Five seeds were implanted and removed 14 days later. Present condition: no sign of disease in the mouth.

CASE 7. *Sarcoma of tonsil.*—Female, aged 73. Treated February, 1928. This patient had a firm, smooth swelling in the left tonsillar region, which had been noticed for three months. Six seeds were implanted. Three were recovered 14 days later and three remain permanently in the tissues. Present condition: tumour has entirely disappeared. Mucous membrane is intact.

CASE 8. *Carcinoma of palate.*—Male, aged 60. Treated June, 1928. This patient was found to have an ulcer covered with slough, involving the whole of the soft palate, and extending forwards on to the hard palate. Ten seeds were inserted for 14 days. Present condition: after a very brisk reaction the ulcer is now almost healed.

CASE 9. *Carcinoma of pyriform fossa.*—Male, aged 52. Treated April, 1928. This patient, who had experienced some dysphagia for six months, was found to have a large fungating growth of the pyriform fossa, obscuring the cords. Five radon seeds were inserted for five days. He was examined again at the end of June. His symptoms had been relieved and the growth had shrunk to about one-third of its original size, the left cord, and part of the right, being visible. Five seeds were again inserted and left for 14 days. His first dose of radon was a small one owing to the possibility of acute œdema and obstruction.

CASE 10. *Carcinoma of bladder.*—Male, aged 54. Treated March, 1928. The patient complained of hæmaturia which started in January, 1928. On examination he was found to have a large infiltrating growth on the right side of the base of the bladder. Eleven seeds were inserted into the tumour. Present condition: satisfactory; patient has no further symptoms, and all bleeding has ceased.

CASE 11. *Epithelioma of anal canal.*—Male, aged 54. Treated December, 1927. This patient had a hard, craggy, ulcerated growth encircling the anal canal immediately within the anal sphincter. Pain and the passage of blood per rectum were prominent symptoms. Twelve seeds were inserted through the skin and left in the tissues at the periphery of the growth. On examination three months later no tumour could be detected. The pain and hæmorrhage had ceased.

Seeds have been successfully planted into growths of the œsophagus, but sufficient time has not yet elapsed to enable an opinion of the value of the method to be given.

General Conclusions.

1. The initial response of the tumour is more rapid than that seen with other forms of radium therapy. (2) The local reaction is brisk in some instances. (Another series of patients is now being treated with more heavily screened seeds.) (3) Owing to the very small size of the seed in proportion to the dose of radium it contains, there is a tendency on the part of the surgeon to implant the seeds too close together, and this over-radiation may possibly account for the severe reaction occasionally met with. (4) The use of seeds enables those tumours, which owing to their nature or position are difficult to treat by other methods, to receive thorough radiation.

We wish to express our gratitude to Mr. W. Lester Alton, physicist at the Radium Institute, and to his assistant, Mr. A. E. Southon, for their helpful advice and skill in the preparation of the apparatus.

THE BROMSULPHALEIN TEST OF LIVER FUNCTION.

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ABOUT 18 months ago my experiences of this test were published, and they were distinctly unfavourable, as a number of normal cases gave abnormal results, and even in cases of definite liver disease 20 per cent. of the readings were at variance with the clinical evidence.[1] For this series a bromsulphalein was made in this country, on the lines of statements made by Rosenthal and White in the *Journal of Pharmacology and Experimental Therapeutics* in 1924. It was subsequently found that this dye differed in certain particulars from that of Rosenthal and White, and in consequence did not give results representative of liver efficiency. Bromsulphalein is, at any rate at present, a proprietary obtainable only from Hynson, Westcott, and Dunning, of Baltimore. I am indebted to them and to Dr. White for having sent me the dye for use in this new investigation. The results are set out below, and they are a contradiction of the previous ones published.

A review of the history of the test was given at some length in a previous paper,[1] and only a few salient points need to be repeated. Bromsulphalein or phenoltetrabromphthalein sodium sulphonate was prepared by White; it is a whitish powder very freely soluble in water, and it can be given with impunity by intravenous injection in a concentrated solution. It is non-irritant, and in ordinary doses absolutely non-toxic. Normally the dye is seized by the liver, and the majority is excreted in the bile, traces only appearing in the urine. The rate of disappearance of the dye from the blood serum is important—after five minutes 20–50 per cent. remains in the blood, whilst at the end of half an hour there is none at all or a mere trace. It was argued that if the liver were damaged it would remove the dye with less rapidity from the blood after injection, and that the degree of retention of dye in the blood stream would give an indication of the degree of liver damage; the originators of the test, Rosenthal and White,[2,3,4] denied that it had any dependence upon biliary permeability.

Technique.

The patient is weighed and the dosage is calculated on a basis of 2 mg. of the dye per kilo body-weight—the body-weight of the patient *in pounds divided by* 55 will give the exact quantity in cubic centimetres of the 5 per cent. solution employed. It is injected slowly into one of the arm veins. Thirty minutes after the injection a sample of blood is withdrawn, preferably from the opposite arm, and in cases of early liver disease it may be necessary to take a sample after five minutes. After the blood has coagulated it is centrifugalised and the clear serum is pipetted into two small test-tubes. To one of these is added one or two drops of a 10 per cent. solution of sodium hydroxide to bring out the colour of the dye, and to the other tube a drop of 5 per cent. hydrochloric acid to clear the serum of any hæmolysis. The amount of dye in the serum is now estimated by direct comparison with a series of standards, using a simple comparator box in the usual way. The standards may be prepared by adding 4 mg. of the dye to 100 c.cm. of water that has been alkalinised with 0·25 c.cm. of a 10 per cent. solution of sodium hydroxide. This represents the 100 per cent. standard, and a series is prepared ranging from 5 per cent. upwards by dilution with alkaline water. In practice it is much simpler to employ the series of non-fading standards prepared by Hynson, Westcott, and Dunning. The 100 per cent. standard represents the amount of the dye that would be present in the blood stream if none were removed: it is thus an arbitrary standard calculated on blood volume.

Clinical Findings.

(*a*) Rosenthal and White[4]:—

	Cases.	Retention expressed in percentages after 30 minutes.
Non-liver	25	0 or a mere trace.
Obstructive jaundice	5	97, 95, 90, 35, 30.
Cancer of liver	2	99, 20.
Catarrhal jaundice	3	75, 50, 35.
Arsphenamine jaundice	2	41, 22 (after 15 min.).
Biliary cirrhosis	1	45.
Portal cirrhosis	3	1, 22, 17.
Syphilitic cirrhosis	1	5.
Pre-eclamptic toxæmia	1	30.
Acute cholecystitis	1	10.
Chronic "	1	5.

(*b*) Friedenwald and Armstrong[5]:—

Catarrhal jaundice	2	28, 36.
Cirrhosis of liver	5	50, 40, 0, 5, 18.
Cancer of liver	8	20, 45, 10, 36, 5, 8, 24, 18.
Syphilis of liver	1	0.
Cancer of pancreas	2	32, 24.

Non-liver Cases.—Cancer of stomach, 5; chronic cholecystitis, 11; achylia gastrica, 7; hyperchlorhydria, 10. All of these showed no retention.

(c) Rouillard[6] :—

Non-liver	25 ..	No retention or a mere trace.
Cancer of liver	1 ..	99.
Cancer of pancreas ..	1 ..	97.
Suppurative cholecystitis	2 ..	95, 90.
Catarrhal jaundice ..	3 ..	75, 50, 30.
Arsenical jaundice ..	1 ..	47.
Cirrhosis	3 ..	45, 22, 17.
Calculous cholecystitis ..	2 ..	10, 5.
Syphilitic cirrhosis ..	1 ..	3.

(*d*) *Personal Cases.*—The technique used was that described above, and the results are expressed as the percentage retained after 30 minutes so that the figures are strictly comparable to those in the accompanying tables.

Non-liver Cases.

Gonorrhœa	9 ..	5; three=0; five=trace.
Dyspepsia	2 ..	5, 0.
Progressive muscular atrophy	1 ..	0.
Hysteria	1 ..	0.
Lymphadenoma	1 ..	0.
Tb. abdomen	1 ..	0.
Convalescent nephritis ..	1 ..	5.
,, pneumonia ..	1 ..	0.
Cancer of breast	1 ..	Faint trace.
Slight cerebral thrombosis	1 ..	Faint trace.
Normal	3 ..	Trace, 0, 0.
Aortic incompetence ..	1 ..	0.
Progressive bulbar paralysis	1 ..	0.
Pleural effusion	1 ..	5.
Pericarditis (convalescent)	1 ..	0.
Asthma	1 ..	0.

Liver Cases.

Portal cirrhosis	7 ..	0, 25, 28 and 30, 7, 0, 25, faint trace.
Obstructive jaundice (cancer of pancreas).	4 ..	*105, 105, 40, 30.*
Catarrhal jaundice ..	2 ..	0 (convalescent, conjunctivæ just icteric), 53.
N.A.B. jaundice	5 ..	0 (7 months after). *50 (22/6/27), 5 (29/6),* 0 (6/7). 0 *(15/7), 5 (21/7),* conjunctivæ just yellow. 15, jaundice rapidly clearing. 70 (18/2/28), 105 (23/2).
Syphilitic jaundice (secondary stage).	1 ..	*75 (2/3/28),* 10 *(28/3)* after a course of N.A.B., much less yellow.
Cholecystitis	2 ..	15, 10 (faintly subicteric).
Obstructive biliary cirrhosis following cholecystec-	1 ..	11/8/27 : 25. 3/9 : 10—less jaundice. 7/9, drainage of common duct; *almost died of* cholæmia. 29/9 : 10.
Cardiac liver — moderate jaundice.	1 ..	18.
Non-calculous cholangitis with *intermittent* painless jaundice for 2 years.	1 ..	30 (11/8/27), 30 (3/9).
? Pancreatic calculus ..	1 ..	0.
Acholuric jaundice with cholelithiasis.	1 ..	12.
Tested during N.A.B. treatment—no symptoms.	2 ..	10 (last injection 14 days before); 0 (2 days *before*).
Congenital chorea ..	1 ..	0.
Primary cancer of liver without jaundice.	1 ..	5.

During the administration of choriotrope three cases were tested :—

1. *35 c.cm.* given, the last dose being 18 days before the test and followed by jaundice—now clear. 40 per cent.
2. *15* c.cm. *given,* the last one month before the test. 0 per cent.
3. 33 c.cm. given, the last ten days *before the test. 0 per cent.*

Two of these cases require a little amplification; the fifth case of N.A.B. jaundice showed a very much greater retention after a period of treatment than before it (105 per cent.); she was clinically improved, however. A possible explanation is that the injection was given into the same vein from which blood was later withdrawn; it is probable that the sample was thus accidentally contaminated with dye from the skin or from the vein. One of the cases of cirrhosis was admitted to hospital for a painless hæmatemesis, a bromsulphalein test showed merely a faint trace of dye after half an hour; at operation later a definite early cirrhosis of the liver was found. There was no reason to suspect a sufficient degree of functional incompetence to produce any dye retention.

Conclusions.

1. Normal cases and those without any liver lesion showed a retention of 5 per cent. to a mere trace or even no dye at all.

2. Cases of liver disease showed a retention which probably represented fairly accurately the degree of liver damage or functional impairment; 100 per cent. retention means that no dye is removed from the blood, and a retention of, say, 50 per cent. would mean that the liver was 50 per cent. incompetent, and so on.

3. The test is one of liver function and not of biliary permeability; this is proved by the fact that many of the cases of complete obstructive jaundice did not give a 100 per cent. retention.

4. The test is safe, simple, and it appears to be the best one we have.

Finally, the writer would like to express his thanks to the honorary medical and surgical staff of the General Hospital, Birmingham, for their kindness in giving him access to their cases.

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Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the 1927 statistics of seven districts :—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Grimsby C.B. .. (88,340)	18·7	11·7	1·19	1·38	2·4	1·4	66/29	5·4	3·7
West Bromwich C.B. (81,140)	20·2	12·4	0·66	0·97	4·7	1·3	107/43	14·6	2·4
Carlisle C. and C.B. (56,620)	18·3	12·3	1·09	1·39	2·4	1·6	68/24	8·7	2·9
Eastbourne C.B. (56,710)	11·5	11·5	0·80	2·0	1·7	1·9	44/18	1·5	4·6
Tunbridge Wells B. (33,870)	12·8	15·7*	0·68	2·26	3·1	3·0	48/23	0·0	4·6
Leamington Spa B. (30,050)	13·5	14·1*	0·99	1·69	2·7	2·4	69/42	7·3	4·9
Colchester B. .. (45,170)	15·6	11·2	0·75	1·46	1·9	1·9	46/—	1·3	5·3

C.B. = County Borough. B. = Borough.

* Health resorts, by attracting as residents old people and invalids, swell many of their death-rates. Thus the death-rates from all causes of Tunbridge Wells and Leamington Spa, when standardised for age and sex constitution of the population, become 11·5 and 10·74 respectively. The contrast between the infant and neonatal mortality-rates of the three health resorts shown above is very striking.

Grimsby.

Dr. B. C. Stevens reports that the municipal maternity home, with ten beds, erected on the council's housing site at Nunsthorpe, was opened for the admission of cases on Sept. 19th. Dr. Stevens thinks it will soon need enlarging. Seven notifications and six deaths from encephalitis lethargica were recorded during the year. The notification of tuberculosis is still not nearly so complete as it might be. Of the 105 total deaths, 24 were of cases not previously notified, and only 29 lived for six months after notification. Insufficient institutional accommodation has been some excuse for incomplete notification in the past, but a scheme now under consideration for the extension of treatment facilities ought to meet this objection. Another feature of the work that requires development is the examination of contacts. At present the staff is insufficient for the visitation of homes for this purpose, and home visitation is considered by Dr. Stevens essential for the full development of examination of contacts. A combined clinic supplies artificial light treatment for the dispensary, the infant welfare centres, and the schools. "On the whole the results have been very encouraging and have amply repaid the expenditure." The total cases treated at the V.D. clinic during the last six years have been 1206, 827, 437, 465, 480, and 533, and the defaulters—that is, those who ceased to attend before being cured—for the same years numbered 547, 479, 184, 93, 89, and 79. Dr. Stevens advocates the establishment of a centre where persons, who have exposed themselves to the risk of contracting venereal disease, can be immediately disinfected by a skilled orderly. He thinks a capital expenditure of £100 or a weekly expenditure of £4 would be ample for the purpose, and that such a scheme would save money by lessening the need for treatment. The causes of the six maternal deaths were puerperal sepsis 2, antepartum hæmorrhage 1, post-partum hæmorrhage 1, and eclampsia 2. The midwives realise the importance of the antenatal supervision put upon them and are referring more cases to the antenatal clinic. The new cases at this clinic numbered 205, the total births being 1624.

West Bromwich.

Dr. W. Stott reports that in September it was decided to reorganise the health visiting staff and to replace the part-time nurses from the district Nursing Association by six newly appointed health visitors, who began their duties on Nov. 1st. The area of the borough is now divided into eight districts, and one nurse is responsible for all the health visiting services in each district. The medical staff has unfortunately been reduced from three to two. As a result it is impossible for the doctor to examine all the children brought to the centres, and it is also impossible to undertake antenatal and postnatal work. The outstanding feature of 1927 was the large number of deaths of children from pneumonia, caused by the prevalence of measles, whooping-cough, and influenza during the first quarter. Dr. Stott advocates provision for the home nursing of measles, whooping-cough, and pneumonia, with hospital accommodation for severe cases, and he further suggests that the first cases of measles or whooping-cough in children under 5 should be made notifiable. The instruction to the midwives to do antenatal work is receiving attention, but renders the provision of an antenatal clinic all the more urgent. Seventy-five stillbirths were notified in 1927 as against 58 in the previous year. There is, as yet, no definite orthopædic scheme, no scheme for the home nursing of children under 5, no minor ailment clinic in connexion with the welfare centres, and no dental treatment included in the maternity and child welfare scheme. Of the 46 deaths from pulmonary tuberculosis 10 were those of cases unnotified, and of the 8 non-pulmonary tuberculosis deaths 6 were those of unnotified cases. The sanitary inspector, Mr. H. H. Spears, after comparing the results of last year's housing inspections with those made of the same houses six and seven years previously, finds "that notwithstanding the general housing activities of the council, conditions as regards two-family occupation and overcrowding in such houses have in no wise improved." The new houses erected during the year numbered 466 and included 286 municipal houses. In a few outlying districts there are still some surface wells in use, and Dr. Stott refers to one used for the supply of three farms, which is liable to pollution by the overflow of the river. The opening of the new Health Department building in December will greatly facilitate the work.

Carlisle.

Dr. Joseph Beard says that the report calls for little comment and that the sanitary condition of the city generally may be said to be good. Out of 20 samples of fresh cow's milk two contained tubercle bacilli, resulting in the eliminiation of one milch cow from the city byres and of two outside cows from a herd in the Longtown area. The Ministry of Health have sanctioned 1728 municipal houses, 1540 "non-parlour" and 188 "parlour." Of these, 1394 have been completed and the remaining 334 were in course of erection at the end of the year. Dr. Beard complains that notification of tuberculosis is frequently so late as to be useless. During 1927 about 18 per cent. of the deaths were those of unnotified cases. A further 8 per cent. of the deaths occurred within one week of notification, while only 37 per cent. survived notification by more than three months. During 1926 the town clerk drew the attention of the medical men of the city to this failure to notify. The register of cases was completely revised during the year and now includes 145 males and 141 females of the pulmonary type and 46 and 47 respectively of the non-pulmonary type. This gives a total of 379, or about six times the average annual deaths during the last six years. Considerable difficulty is experienced in obtaining a satisfactory examination of contacts, but there is some improvement with regard to children. During the year the practising midwives attended 382 confinements and sent for medical help in 120, or more than 30 per cent. of their cases. The antenatal clinic was attended by 185 mothers who paid from three to four visits each; the total births numbered 1037.

Eastbourne.

Dr. W. G. Willoughby reports that 405 houses were erected during the year, of which 198 were municipal and 45 subsidised houses erected by private enterprise. No houses at low rents have been built recently except by the municipality, but houses at as low a price as £700 have been built for sale. The council assisted the private purchase of houses in 78 instances during 1927, making a total of 260 houses so dealt with. The temporary army hutments have been reduced from 188 tenements to 36 and the last 36 tenants are difficult to deal with, but "it is time that these huts should be totally demolished." The lowest rents for municipal "non-parlour" houses are 14*s*. 6*d*. weekly. The total of municipal houses occupied and planned is 723, but building for yearly needs must go on, says Dr. Willoughby, and particularly for those who canont afford the rent mentioned. Of the 764 applicants for new houses 90 have a whole house at present, 99 are newcomers, and 109 live outside the borough. Of the remaining 466, who have been in the borough more than five years, 78 have no child, 200 have one child only, and 89 have at least three rooms each. Dr. Willoughby estimates that there are at least 200 to 250 good tenants in a difficult position. There is too much sharing and subletting of houses, and many of the applicants would like a smaller house at a lower rent. Some of the municipal tenants have caused overcrowding by subletting. The municipal maternity home (ten beds) has been improved by the provision of extra accommodation for the staff and of facilities for antenatal work. The orthopædic clinic is run by a voluntary association for whom the local authority provides a consultant. An enclosure on the sea front, in connexion with it, allows sun treatment to be provided for children in the summer. Dr. Willoughby states that the regulations for the protection of meat have almost no practical effect owing to the restrictions involved. The majority of meat vendors object to sheltering the meat behind closed windows. Dr. Willoughby disagrees with those who favour the shortening of the stay of scarlet fever patients in hospital. The revision of the tuberculosis register has reduced the cases to 318 which is about seven times the tuberculosis deaths for 1927. The rainfall for the year was 38·22 in. The sunshine record, 1698·8 hours, was the fourth highest recorded in the United Kingdom, excluding the Channel Isles and Scilly Isles.

Tunbridge Wells.

Dr. F. C. Linton says that apart from a sharp outbreak of influenza in February involving temporary school closure and causing many deaths amongst old persons, there was no notable outbreak of infectious disease during the year. The municipality works chiefly by subsidising voluntary institutions. Since April 1st, 1928, an agreement has been made for the treatment of children by massage, exercises, electricity, &c., at the clinic established at the general hospital. The district Nursing Association is subsidised for the home nursing of children and for the provision of a nurse-midwife in Rusthall. Payment is made by fees to various hospitals for the treatment of tonsils and adenoids. An arrangement has been made with the maternity home for the admission of municipal cases and three cases were sent in in 1927 where the mother's home environment was unsatisfactory and her circumstances needed financial aid. A chart shows that diphtheria was exceptionally prevalent from 1896 to 1900 and again from 1911 to 1915. Dr. Linton argues from these figures that the disease should be rife from 1926 to 1930 and in accordance with his prediction the notifications rose to 42 in 1927, after an average of about 12 for the four preceding years. There was only one death. The school report shows that the question of an open-air school for 40 children has been advanced a stage further by the raising of £1000 by voluntary contributions. Dr. J. A. Walker Wood began work as aural surgeon in the schools in April, 1927. The rainfall was 40 in. and the hours of bright sunshine 1527⅔.

Leamington.

Dr. W. L. Goldie reports that the baths have been rebuilt and now compare most favourably with those of any spa in the country. A new scheme of filtration has been installed for both the men's and women's swimming baths. The total number of council houses was brought up to 286 by the erection of 83 during the year. There were 12 subsidised private enterprise houses. The "Leamington Slum Clearance" Company built eight houses at Lillington which were intended to be let at an inclusive rental of 5s. a week, but were ultimately let at 10s. An agreement has been made with the Warneford Hospital for the subsidisation of three maternity beds. Mr. G. C. Alderson, who is in charge of the obstetric department of this hospital, conducts an antenatal clinic for the patients seeking admission to the hospital, and he has been appointed specialist for the purpose of the Puerperal Fever Regulations. The rainfall was 28·84 in. and the record of bright sunshine 1121·7 hours.

Colchester.

Dr. W. F. Corfield gives a table, which shows that 24 of the 35 infant deaths were due to congenital debility and premature birth. He hopes that the work of the antenatal centre begun in March, 1928, will help to reduce this figure. The deaths of children during the first year of life numbered 35, during the second year 14, and of those from 2 to 5 years 13. An effort is being made to find suitable premises for a maternity home, but so far unsuccessfully. The orthopædic clinic is doing good work and treated 17 infants as compared with 9 in the previous year. A difficulty has arisen with the local division of the British Medical Association with regard to the appointment of a consultant for the purpose of the Puerperal Fever Regulations. During the year 192 subsidised houses were built, 106 municipal and 74 by private enterprise. Reports of overcrowding are still received and there is need of accommodation for the poorest working-class families. Unfortunately a large number of families have to live in two rooms or even one room owing to the cost of housing accommodation. During the past years there has been much building of new houses in the outskirts. This is being now followed by the extension of water mains and sewers, which should ultimately enable shallow wells to be closed and cesspools to be abolished. During 1927, however, 19 new cesspools and 7 new wells were constructed. About 550 "hand-flushed" closets have been provided with a water-supply during the last three years.

SCHOOL MEDICAL SERVICE.

Name of district.	No. on roll.	Aver. elem. school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.*
Northampton C.B.	12,352	11,107	3,432	7,687	18·7
Bournemouth	7,984	6,796	2,160	3,952	14·0
Hull	47,517	38,614	17,075	34,719	15·8

* Excluding uncleanliness and dental defects.
C.B. = County Borough.

Northampton.

It would, we think, be admitted that the extent of the facilities for preventing and treating childish defect and disease is a fair measure of the interest taken in child hygiene by any community. Judged by this standard Northampton comes out badly, for in this county borough even the routine inspections cannot be overtaken by the school medical staff, and much of the value of their work is necessarily lost. Dr. Stephen Rowland, in his introduction to the report by Dr. J. H. Mason, says he does not think that the two sessions per week now given by the assistant tuberculosis officer will be sufficient to keep pace with the work; he does hope, however, that the arrears in dental treatment will be made up by the second dentist now appointed. Dr. Mason, who until last October carried out the school medical work single-handed, draws attention to the large number (246) of delicate, anæmic, and debilitated children who would benefit by the régime of an open-air school. Dr. Rowland is "not convinced that the so-called 'open-air school' is much in advance of the latest elementary schools opened in Northampton." He does not describe the conditions of these new schools, but it would seem that a properly constituted open-air school, with a specially designed curriculum, where there is fuller medical supervision, extra rest, suitable meals, and out-of-doors lessons and games, is more suited to the needs of a delicate child than even the most modern elementary school where the curriculum and routine work are arranged for the average healthy normal child. It is often the endeavour to keep pace with his more lusty fellows that pushes the delicate child over the brink of definite ill-health. Dr. Mason describes the work done in Wellington-place Special Mental Defective School, opened in 1907, and supervised from its inception by Miss Longland, who also acts as secretary to the committee of voluntary workers which looks after the welfare of past pupils. In all, 234 children have passed out, of whom 24 are dead, 101 are either in institutions or not in work, and 109 are partially or wholly self-supporting. Whatever the future may hold in the way of prevention or of treatment of mental defectives, it is certain that the discipline, interest, and self-respect instilled by the simple manual occupations at present taught in the special schools is well worth the cost, for if these unfortunates are left unheeded they become a greater burden on the community.

Bournemouth.

Dr. T. S. Stirling remarks that the general work of medical inspection is progressing satisfactorily, and notes a continued improvement in the standard of personal hygiene due to the work of the school nurses, aided by lending out, if required, of special combs with a leaflet of instruction. The dental work has been efficiently carried out, but there is still a long list awaiting treatment, and the pre-school child must not be forgotten. Dr. Stirling says that in this, as in many of the other defects and diseases of childhood, preventive treatment should be attempted at an earlier age; this, with a suitable physiological diet in infancy, will lessen the prevalence of dental caries in school children. The idea of the special class for backward children was to return these children after a course of 6 to 12 months to their own school with a reasonable expectation of making normal progress; this has not been realised, though the children have derived benefit, especially physically. Probably there are in this class all three types of retarded children—namely: (1) The true backward, that is those who have merely lost education time through being handicapped by disease or physical defect, and thus need a recovery class; (2) the true dull, those who are mentally slow and better with concrete material, and thus need a handicraft class; (3) the true mental defective, mentally lacking in all kinds of intelligence, needing training in concentration, stabilising in temperament, and some degree of care, control, or supervision in after-life. The formation of even this one experimental class is of value, especially as it is a small one with only 15 children, so that an energetic teacher will try to group the children for herself. It is, however, regrettable that there are no special schools and particularly no open-air school, for there are in Bournemouth 246 delicate children with whom results could be obtained comparable with the splendid record of many similar towns.

Hull.

Dr. W. Allen Daley deals with important schemes of reorganisation, details of which are given by his chief assistant, Dr. J. Morrison. Routine examinations have increased from 15,526 in 1926 to 17,075. The standard of marking for defects has been made slightly more stringent, to bring it into line with that of other authorities; thus the percentage of defects this year amounts to 15·8 compared with 10·5 in 1926, although the actual numbers of defects have probably not increased. Special inspections show a great increase as the result of the new scheme by which teachers send children to the medical officer at a school clinic, instead of waiting for a routine visit to the school. Treatment at the clinics has been greatly expanded —6200 minor ailments were treated this year as against 3281 in 1926. X ray treatment for ringworm will in future be given by the two newly appointed radiologists. In dental treatment there has also been a reorganisation of the scheme, including an extension to include the 5-year-old group, increased general facilities with the appointment of an additional dentist, and the elimination of casual cases, which are very unsatisfactory. There are, further, some new activities at the clinic; those of the aural surgeons, Mr. T. Ritchie Rodger and Mr. R. R. Simpson, whose expert opinion is found so valuable in cases of tonsils and adenoids, and of the orthopædic clinic just started under Mr. R. B. Blair. This orthopædic clinic deals also with cases referred by other departments—the general public health, the tuberculosis, and the maternity and child welfare.

The planning of this work as regards school-children was temporarily upset by an epidemic of acute poliomyelitis affecting 22 children over 5 years of age, and over 70 below that age. Of the older group one died during the attack, in four cases the paralysis cleared up, and in 17 there remained varying degrees of disability, though, as usual, there was some tendency towards recovery. The younger group is not similarly described, but it is certain, as Dr. Morrison says, that the epidemic will leave lasting traces among the school-children of future years. The action taken illustrates very well the advantages of coördination. Many of the victims were isolated and treated in the City Hospital; they were examined by the school orthopædic surgeon, who prescribed the treatment to be carried out both in hospital and after discharge. Later they were taken to the Park Avenue School for physically defective children, where splints were applied when necessary, and appointments made for massage, electricity, or remedial exercises at the orthopædic clinic. In the case of private patients, letters were sent to the doctors offering facilities for treatment at the orthopædic clinic, which was in the majority of cases accepted. Two recently appointed orthopædic nurses carry out this treatment at the clinic under the supervision of the surgeon. Minor postural deformities are reported to the organiser of physical training for special exercises to be given at school.

Another important step has been taken in the new practice of examining mentally all the children admitted to the craft classes, thus raising these classes to their proper function of dealing with the concrete minded children, who are intelligent enough but not literary, instead of allowing these classes to become the dumping ground for all types of retarded and defective children. The whole report shows evidence of a highly efficient staff working with an enlightened local authority.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 4TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 126 (last week, 149); scarlet fever, 1461; diphtheria, 882; enteric fever, 277; pneumonia, 526; puerperal fever, 39; puerperal pyrexia, 85; cerebro-spinal fever, 7; acute poliomyelitis, 2; acute polio-encephalitis, 2; encephalitis lethargica, 28; dysentery, 7; ophthalmia neonatorum, 139. No case of cholera, plague, or typhus fever was notified during the week.

A large proportion of the cases of enteric fever were notified in London and the home counties, viz.: London 87 (of which 26 in Kensington, 17 in Wandsworth); Buckingham, 4; Essex, 5; *Hertford*, 7; Kent, 7; Middlesex, 25 (of which Ruislip-Northwood 6); Surrey, 97 (of which Beddington and Wallington 24, Epsom 23, Sutton and Cheam 10, Epsom Rural 18). The 277 notifications included 175 cases of paratyphoid fever, of which 60 were notified in London, 83 in Surrey, and 11 in Middlesex.

The number of patients in the Infectious Hospitals of the Metropolitan Asylums Board on August 7th–8th was as follows:—Small-pox, 17 under treatment, 1 under observation; scarlet fever, 1706; diphtheria, 1681; enteric fever, 72; measles, 263; whooping-cough, 187; puerperal fever, 14 (plus 9 babies); encephalitis lethargica, 71; poliomyelitis, 2; "other diseases," 15. At St. Margaret's Hospital there were 17 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (2) from enteric fever, 21 (2) from measles, 2 (2) from scarlet fever, 36 (4) from whooping-cough, 29 (5) from diphtheria, 50 (14) from diarrhœa and enteritis under two years, and 16 (4) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever outside London was reported from Edmonton. Of the 19 fatal cases of measles outside London, 6 were reported from Liverpool and 3 from Newcastle-on-Tyne. Belfast reported 5 in the same week. Of the 32 fatal cases of whooping-cough outside London, 7 were reported from Birmingham, 4 from Manchester, and 3 from Liverpool. The deaths from diarrhœa showed no increase.

The number of stillbirths registered during the week was 295 in the great towns (corresponding to a rate of 41 per thousand births), including 43 in London.

THE PROCEEDS OF HOSPITAL FÊTES.—During the last eight years. Hendon Cottage Hospital has received £7287 as the proceeds of an annual fête. This year's event resulted in a profit of £1050.

Reviews and Notices of Books.

TRAUMA AND COMPENSATION IN OBSTETRIC AND GYNÆCOLOGICAL CASES.

By DOUGLAS MARSHALL LINDSAY, M.D., F.R.F.P. & S. Glasg., Senior Assistant Visiting Surgeon, Royal Samaritan Hospital, Glasgow. London and Edinburgh: William Hodge and Co., Ltd. 1928. Pp. 172. 7*s.* 6*d.*

THIS book is a useful contribution to a subject either cursorily dismissed or not considered at all in obstetric and gynæcological treatises. Yet, as the author points out, application for damages is very common among women, and real or fancied injury to a pregnancy offers "a good background for the staging of a case before an impressionable jury." The number of cases quoted from Dr. Lindsay's own experience serves to show both the frequency of claims of this kind and the solid foundation of practical knowledge on which this book is built. The instructions as to methods of examination, the way to record findings, and the precautions to be taken when giving an opinion are excellent.

Concerned, as it is, with a very special side of obstetric and gynæcological practice, this book may not appear to be of general interest, but even a superficial glance reveals many points that have a much wider application than its title suggests. It contains, for example, an excellent review of the diagnosis of pregnancy in which the various symptoms and signs are weighed and the value appraised of those that are of use in estimating the stage that the pregnancy has reached, and in determining the life or death of the fœtus in utero. One sign in the diagnosis of pregnancy, that form of external ballottement known as "dipping" has been overlooked. To many it is the most certain and quickest method of differentiating the pregnant uterus from other cystic swellings at or about the umbilical level and before fœtal parts can be distinctly recognised.

Dr. Lindsay makes a very definite statement that trauma is never a causative factor in the production of a neoplasm; his views on this question are diametrically opposed to those expressed by Dr. Janet Lane-Claypon in regard to injury as an ætiological factor in mammary carcinoma (Ministry of Health Report No. 32). Sarcoma of bone appearing after injury he regards as "having probably been the precursor of the fracture." Whilst refusing to consider a traumatic cause for pelvic growths, simple or malignant, he gives full consideration to the possibility of their being adversely affected by injury, as by the occurrence of torsion, rupture, necrosis, and infection.

The volume has closed a distinct gap in gynæcological literature, and will be found exceedingly helpful to those who have to make frequent appearances in the law courts to give a medical opinion in those compensation cases or actions for damages in which possible pelvic injury to women is in question. The author's experience in obstetrics and gynæcology, and as assistant to the Professor of Medical Jurisprudence in Glasgow, makes his advice of particular value in such cases.

EXPERIMENTAL EMBRYOLOGY.

BY THOMAS HUNT MORGAN, Professor of Experimental Embryology in Columbia University. New York: Columbia University Press. 1927. Pp. 766. 37*s.* 6*d.*

THE introduction of experimental methods, chemical, physical, and physiological, into embryology is an important development. Although such methods have been applied for over 40 years by a few scattered workers and have yielded fruitful results, these results have so infrequently been brought to the general notice that those not intimately familiar with the work have difficulty in correlating them and in appreciating their full significance. Prof. Morgan's book, which is a complete and critical survey of the important experimental researches, will be welcomed. Moreover, it will appeal to a wider section of scientific workers than did the older embryology books, which described the building up of evidence in a chain of pictures revealed by the microscope. The experimentalists have called into play methods more proper to the chemical and to the physiological laboratories. This change of outlook has revealed new lines of attack on the problems presented by each stage in the complicated process of development. The changes which take place in the process of fertilisation of the egg are vast and complex. Already the amount of fruitful experimental research relating to that incident alone, including the questions of the activity, chemotaxis and agglutination of spermatozoa, the fertilisation, membrane and its functions, selective fertilisation, cross-fertilisation, and polyspermy, exhausts eight chapters, or over 100 pages of the book.

The remaining six hundred odd pages are occupied with the questions involved in the changes in cytoplasm prior to cleavage of the cell, and in the movements of groups of cells following cleavage. Such matters as growth, reflex actions, and trophistic movements of larvæ, sex determination, embryonic grafting, the influence of environment on the development of the embryo, and the source of energy of development, are promised for a future volume. The investigations relating to each section are recorded more or less in their chronological order. The author's conclusions, which are restrained and conservative, are inserted into the text at intervals none too frequent. His obvious reluctance to introduce speculative matter might indeed have been modified to the extent of furnishing short summaries at the end of each section, for an historical account of such complex work must necessarily in places be disjointed, calling for effort on the part of any reader anxious to understand the trend and significance of the progress made. However, since Prof. Morgan provides over 2000 references to works on experimental embryology and sets forth concisely and lucidly a description of practically every important piece of work that has been done on the subject, no one need complain.

To workers in every branch of biology who are seeking for a new line of research this book should provide a mine of inspiring suggestions.

ENDOCRINE DISEASES.

Endokrine Krankheiten. By Prof. Dr. HANS CURSCHMANN, Direktor der medizinischen Universitätsklinik zu Rostock I.M. Dresden and Leipzig: Theodor Steinkopf. 1927. Pp. 151. R.M.S.5.

THE series of monographs to which this volume belongs is designed to give a practical survey of the various domains of medicine. Prof. Curschmann's Endocrine Diseases can claim to have fulfilled this object. Controversial matter has been almost entirely ignored, and where theoretical interpretation is still far from clear the author has contented himself with giving the facts and a short allusion to the difficulties. No condition associated with disease of the endocrine system seems to have been omitted. The method of dealing with any particular gland is to give first a short description of its anatomy and physiology, then a detailed account of the symptomatology, pathogenesis, prognosis, and treatment of diseases associated with it. Certain rare metabolic disturbances of uncertain origin are included. For instance, a section is devoted to what is termed endogenous cachexia. This condition is conceived as the clinical antithesis to endogenous obesity. The author differentiates it from a masked hyperthyroidism, in which there are no eye or circulatory disturbances, and from wasting of hypophyseal origin (Simmond's disease). The metabolic rate is not raised nor is the protein metabolism increased, as in Graves's disease, and yet there occurs a progressive loss in weight until the patient becomes a veritable skeleton. The author claims that by psychotherapeutic measures the appetite of these cases can be so stimulated that the weight increases. By doses of insulin up to 20 units daily weight can also be made to increase, but the writer denies that the condition is in any sense of the word a "hypo-insulinism." In view of the most recent work on mongolism it is strange to find this condition included in this monograph; indeed, the author himself, having described the malformation, concludes that there is no evidence of an endocrine dyscrasia. An interesting point in the treatment of exophthalmic goitre is emphasised—the importance of diet. This is a revival of the old view of Blum that the diet should consist of foods containing a minimum of tryptophane, which is the chemical basis of thyroxin. Meats, milk, cheese, eggs, and wheat are rich, whilst maize, rye, potatoes, and fruits are poor in this substance. However, since one of the main objects of treatment is to re-establish nitrogen equilibrium in the exophthalmic patient, it would not be very easy to avoid those foods which are here condemned.

The section on diseases of the sex glands has been written by Dr. F. Prange and is well illustrated. The space allotted to details of treatment in this book is rather scanty, but the general principles which should guide the management of the patient are made clear.

The Clinical Examination of the Lungs.

Second edition. By E. M. Brockbank, M.D. Vict., F.R.C.P.; and Albert Ramsbottom, M.D. Vict., F.R.C.P. London: H. K. Lewis and Co., Ltd. 1928. Pp. 112. 5s.

This book was written for students, and is intended to outline the methods of examining the chest. It is not sufficiently detailed to appeal to the post-graduate student, who would require more detail. After a brief chapter on physiology and anatomy, five chapters are given up to a discussion of the symptoms and physical signs of pulmonary disease, the authors following the orthodox order of inspection, palpation, percussion, and auscultation. The last chapter deals with physical signs of common pulmonary diseases, and this is too sketchy to be of real value even to students. Very little space is devoted to each disease, such a variegated condition as new growth of mediastinum, lung, and pleura being dismissed in six lines. The reader is told that X ray examination is a useful aid to diagnosis in various conditions, but it is not made clear in what way it may help. At the end of the book are eight X ray plates illustrating a normal chest and various pathological conditions. If the volume is regarded as a convenient and clear, but not exhaustive, account of physical signs and symptoms in diseases of the chest it will prove a useful addition to the students' library.

Bacteriology.

Handbuch der Pathogenen Mikroorganismen. Third edition. Edited by Kolle and Wassermann. Revised and enlarged with the assistance of W. Kolle, R. Kraus, and P. Uhlenhuth. Jena: Gustav Fischer; Berlin and Vienna: Urban and Schwarzenberg. 1928.

The new edition of Kolle and Wassermann's well-known text-book upon bacteriology is now in process of making its appearance in instalments; up to the present time 12 parts have been received, representing portions of the ten volumes of which the book will ultimately consist, none of which has yet appeared in its entirety. The wealth of detail is greater than that given in any other work on bacteriology with which we are acquainted; the article on plague, to take a single example, by Dieudonné and Otto, occupies 223 pages and is superbly illustrated. The work is already firmly established as a mine of information upon all the ramifications of bacteriology and immunity. Amongst the subjects dealt with in the parts which we have received are plague; Asiatic cholera, which comprise the whole of one part, a matter of 178 pages; glanders; rinderpest and other special animal infections; diplococcal infections; and a large part of the subjects of general bacteriology, immunity and serology. When complete the book will form a standard book of reference and, meanwhile, has the advantages of a series of monographs, each contributed by an authority in his own special sphere.

Investigation of the Concentration of Lactic Acid in Blood and Urine under Physiologic and Pathologic Conditions.

By Otto Jervell. Acta Medica Scandinavica, Supplementum XXIV. Oslo: Nationaltrykkeriet. 1928. Pp. 135.

This book consists of a collection of researches carried out during the last four years by the author, partly at the Physiological Institute of the University of Oslo, and partly at the Oslo Municipal Hospital. It is divided into three parts: the first, an introduction, deals with previous work and methods of analysis, the second with lactic acid under physiological conditions, and the third with the concentration of lactic acid in the blood in various pathological states. In the first part some six pages are devoted to a very brief review of the work, beginning with that of Fletcher and Hopkins in 1907, which deals with the rôle of lactic acid in the metabolism of carbohydrates. Dr. Jervell then proceeds to describe the method used by him for the estimation of lactic acid in blood and urine. In the case of blood, the proteins are first precipitated by tungstic acid, as in Clausen's method, using 2 c.cm. of blood. The glucose, together with a part of the uric acid, is then removed from the filtrate by the use of copper sulphate and calcium hydroxide. The estimation is performed upon the filtrate from this precipitation by Hansen's method, which involves the oxidation of the lactic acid to acetic acid and carbon dioxide by a measured excess of potassium dichromate solution and sulphuric acid. The unused dichromate is afterwards estimated iodimetrically. When lactic acid in urine is being determined, it is necessary first to extract the lactic acid by means of ether, using Clausen's apparatus for this purpose. Tables are given showing that the mean error is approximately 5 per cent. In the second section, the lactic acid concentration of human blood during rest is first investigated. The average value of a series of determinations on four subjects is found to be 27 mg. of lactic acid per 100 c.cm. of blood, the extreme values found being 21 and 31·5 mg. per cent. The difference between the lactic acid figures of fasting subjects and those who have had a breakfast of bread and milk is shown to be negligible. Then follows an investigation of the lactic acid concentration in blood during muscular work, using a cycle-ergometer. In every case muscular exercise produces hyperlactacidæmia, the increase being greater in the first minutes of exercise than later. Large outputs of work (over 1000 kg. meters per minute) bring about a considerable increase of lactic acid concentration in the blood; on resting, this slowly falls off, reaching the normal value again in about half an hour. Mild exercise causes this falling off to be slightly more rapid. The hyperlactacidæma is due to a shortage of oxygen, and the oxygen debt calculated from the lactic acid present is approximately equal to that actually found. The urinary lactic acid after physical exercise may increase to 1 per cent., the excretion in the urine being increased by the administration of alkali.

The author then proceeds to investigate the lactic acid concentration of blood and urine in subjects

Reviews and Notices of Books.

TRAUMA AND COMPENSATION IN OBSTETRIC AND GYNÆCOLOGICAL CASES.

By DOUGLAS MARSHALL LINDSAY, M.D., F.R.F.P. & S. Glasg., Senior Assistant Visiting Surgeon, Royal Samaritan Hospital, Glasgow. London and Edinburgh: William Hodge and Co., Ltd. 1928. Pp. 172. 7s. 6d.

THIS book is a useful contribution to a subject either cursorily dismissed or not considered at all in obstetric and gynæcological treatises. Yet, as the author points out, application for damages is very common among women, and real or fancied injury to a pregnancy offers "a good background for the staging of a case before an impressionable jury." The number of cases quoted from Dr. Lindsay's own experience serves to show both the frequency of claims of this kind and the solid foundation of practical knowledge on which this book is built. The instructions as to methods of examination, the way to record findings, and the precautions to be taken when giving an opinion are excellent.

Concerned, as it is, with a very special side of obstetric and gynæcological practice, this book may not appear to be of general interest, but even a superficial glance reveals many points that have a much wider application than its title suggests. It contains, for example, an excellent review of the diagnosis of pregnancy in which the various symptoms and signs are weighed and the value appraised of those that are of use in estimating the stage that the pregnancy has reached, and in determining the life or death of the fœtus in utero. One sign in the diagnosis of pregnancy, that form of external ballottement known as "dipping" has been overlooked. To many it is the most certain and quickest method of differentiating the pregnant uterus from other cystic swellings at or about the umbilical level and before fœtal parts can be distinctly recognised.

Dr. Lindsay makes a very definite statement that trauma is never a causative factor in the production of a neoplasm; his views on this question are diametrically opposed to those expressed by Dr. Janet Lane-Claypon in regard to injury as an ætiological factor in mammary carcinoma (Ministry of Health Report No. 32). Sarcoma of bone appearing after injury he regards as "having probably been the precursor of the fracture." Whilst refusing to consider a traumatic cause for pelvic growths, simple or malignant, he gives full consideration to the possibility of their being adversely affected by injury, as by the occurrence of torsion, rupture, necrosis, and infection.

The volume has closed a distinct gap in gynæcological literature, and will be found exceedingly helpful to those who have to make frequent appearances in the law courts to give a medical opinion in those compensation cases or actions for damages in which possible pelvic injury to women is in question. The author's experience in obstetrics and gynæcology, and as assistant to the Professor of Medical Jurisprudence in Glasgow, makes his advice of particular value in such cases.

EXPERIMENTAL EMBRYOLOGY.

By THOMAS HUNT MORGAN, Professor of Experimental Embryology in Columbia University. New York: Columbia University Press. 1927. Pp. 766. 37s. 6d.

THE introduction of experimental methods, chemical, physical, and physiological, into embryology is an important development. Although such methods have been applied for over 40 years by a few scattered workers and have yielded fruitful results, these results have so infrequently been brought to the general notice that those not intimately familiar with the work have difficulty in correlating them and in appreciating their full significance. Prof. Morgan's book, which is a complete and critical survey of the important experimental researches, will be welcomed. Moreover, it will appeal to a wider section of scientific workers than did the older embryology books, which described the building up of evidence in a chain of pictures revealed by the microscope. The experimentalists have called into play methods more proper to the chemical and to the physiological laboratories. This change of outlook has revealed new lines of attack on the problems presented by each stage in the complicated process of development. The changes which take place in the process of fertilisation of the egg are vast and complex. Already the amount of fruitful experimental research relating to that incident alone, including the questions of the activity, chemotaxis and agglutination of spermatozoa, the fertilisation, membrane and its functions, selective fertilisation, cross-fertilisation, and polyspermy, exhausts eight chapters, or over 100 pages of the book.

The remaining six hundred odd pages are occupied with the questions involved in the changes in cytoplasm prior to cleavage of the cell, and in the movements of groups of cells following cleavage. Such matters as growth, reflex actions, and trophistic movements of larvæ, sex determination, embryonic grafting, the influence of environment on the development of the embryo, and the source of energy of development, are promised for a future volume. The investigations relating to each section are recorded more or less in their chronological order. The author's conclusions, which are restrained and conservative, are inserted into the text at intervals none too frequent. His obvious reluctance to introduce speculative matter might indeed have been modified to the extent of furnishing short summaries at the end of each section, for an historical account of such complex work must necessarily in places be disjointed, calling for effort on the part of any reader anxious to understand the trend and significance of the progress made. However, since Prof. Morgan provides over 2000 references to works on experimental embryology and sets forth concisely and lucidly a description of practically every important piece of work that has been done on the subject, no one need complain.

To workers in every branch of biology who are seeking for a new line of research this book should provide a mine of inspiring suggestions.

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From the medical standpoint, therefore, the Association's proposal has much to recommend it; but there are certain obstacles to its being adopted. In the first place it may be observed that though reform of our lunacy law is inevitable, the prospect of it is by no means immediate. Sir FREDERICK WILLIS, lately chairman of the Board of Control, not long ago described the efforts of the Board to obtain amendment of the Lunacy Acts, and attributed their failure to a public apathy which refuses to be disturbed. The only noticeable symptom of any change in this attitude has been alarm at the restriction of liberty which the law already allows. This manifestation has taken the form of awarding fanciful damages against medical practitioners on the alleged ground of negligence in certification, and its result has been to make administration of the law more difficult, so that we approach a deadlock. What, then, will be the attitude of the public towards the British Medical Association's suggestion that a patient should be admitted to an institution without his consent, merely "on an 'Authorisation for Treatment' given by a relative or friend and supported by a 'recommendation' signed by two medical practitioners"? Will they not regard this as evidence of a desire on the part of medical men to be given powers altogether outside their proper province? Will they not think of it as another and flagrant attempt to strengthen the grip of the profession on mankind? The liberty of the subject is a national ideal, and one which no law reformer is likely or anxious to ignore. Though the law, in varying degrees at various stages of its history, has regarded the lunatic, the married woman and the infant as not fully capable of legal rights, Parliament would hardly dare to-day to decree that any of these classes of persons should be compulsorily detained in the absence of judicial proceedings.

One aspect of this proposal deserves more thought, perhaps, than it has yet received. If mental patients are to be placed in institutions without their express consent, on the decision of a relative or friend, recommended by two doctors, an unavoidable responsibility is bound to fall on the medical men concerned. Civil actions would certainly be brought against them from time to time, and it would not be at all surprising if lay juries were to make the most of these opportunities of registering a natural dislike of iatrarchy, or government by doctors. The profession is at the moment averse from increasing the number of vulnerable areas in its own skin, and is, indeed, anxious to disclaim a good deal of the responsibility placed upon it under the present Lunacy Acts. It is increasingly felt, moreover, that the further protection, which (to quote the Royal Commission) "should be given to medical men in the discharge of their professional duties in relation to insanity," can best be obtained by putting more of the onus of certification upon the representatives of the law rather than by taking it away from these officials. While no practitioner would wish to escape his proper liability to take due care, the British Medical Association's Representative Body has itself approved the principle that "the judicial authority, when it intervenes, shall accept responsibility for the detention of persons of unsound mind." And, oddly enough, this attempt to minimise medical responsibility is more likely to win public approval than the Association's plan for minimising legal intervention; though the former is made purely in the interest of the profession, whilst the latter is designed entirely for the benefit of mental patients.

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where impeded oxygen intake might be supposed to lead to hyperlactacidæmia. Examinations of 29 patients with heart disease, five of which were compensated, are quoted. In compensated heart disease the lactic acid concentration of the blood is normal, but it is frequently increased in cardiac insufficiency. In anæmia the lactic acid in the blood is found to be increased in a large proportion of the cases examined. Pneumonia and pulmonary tuberculosis may lead to increased lactic acid concentration in the blood. Fever does not increase the lactic acid content, but in spastic conditions hyperlactacidæmia is observed. In nephritis this is the case only where uræmia is present.

The book would be more readable if the sections had been planned to form a connected story instead of in a form resembling a series of publications in a scientific journal, but it represents a large amount of interesting work. A well-selected bibliography is included at the end of the volume.

DENTAL PROSTHETIC MECHANICS.

By D. M. SHAW, Curator of the Prosthetic Laboratories, Royal Dental Hospital of London. London: Edward Arnold. 1927. Pp. 373. 21*s*.

THIS book has been written for the dental student and for the laboratory mechanic, and the author expresses a diffident hope that it will interest the dentist as well. He rates his book too modestly. This is a most stimulating and original treatise on practical dental prosthesis. Mr. Shaw has had a wide experience as a teacher, and has also been active in research which has attracted attention from dentists and anatomists. He has not attempted to give a formal account of the steps in the construction of a denture, but rather to consider the various aspects of dental prosthesis and to comment on the underlying chemical, physical, and anatomical principles involved. This leads him into a consideration of many difficult problems which demand the close attention of the reader, but he does not neglect to mention practical tips which the laboratory worker will find useful. His views are not always orthodox, and the dentists who have given special study to dental prosthesis may find themselves in conflict with some of them; but they will not find it easy to dispose of his arguments. Among the sections to be singled out for special praise are those on the setting up of artificial teeth, articulators and metal-plate work. The preliminary chapter on the arrangements of the natural teeth is a useful contribution to an aspect of dental anatomy which has not received much attention.

The style in which the book is written is rather involved, and it is sometimes difficult to follow Mr. Shaw's meaning, but the effort is worth making, for the book shows real originality. It is well illustrated and excellently produced.

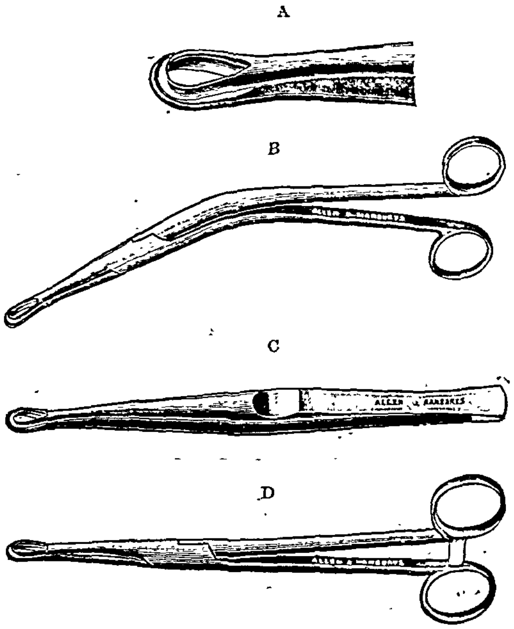
JOURNALS.

MEDICAL WOMEN'S INTERNATIONAL JOURNAL.—The May issue (Vol. I., No. 6) is given up entirely to the proceedings of the open meeting of the Medical Women's International Association held at Bologna from April 11th to 14th last. Summaries are given of all the 34 papers on the two subjects selected for discussion—viz.: (1) medical measures for the protection of children in various countries; and (2) diseases of the eye in relation to general medicine. The abstracts are printed in English or French, the journal being reluctantly restricted to these two languages on financial grounds. It is understood, however, that the Italian association of medical women is bringing out its own report of the proceedings, and the German association publishes its own monthly journal. The papers, given in summary, are well worth careful study, and it is a pleasant surprise to find an example of an international journal which does not contain typographical errors.

New Inventions.

IMPROVED FORCEPS.

SOME years ago when working out an instrument for holding that very friable organ, the tonsil, during dissection, I designed a grip which I believe to be both new and of a fairly wide application in surgery. Its principle is to produce a ruck in the material grasped by its blunt overlapping jaws (A), much in the way of the Army Regulation fastener for webbing straps. It is obvious that a grip of this sort will tear out less easily in flimsy material than one that depends for its hold on piercing or crushing. The original tonsil forceps (B) proved so popular that I have had two other models made—a tissue forceps (C) which is very useful for holding tuberculous glands, cyst walls, and other "washy" tissues, and a bowel forceps (D) which I think will grip intestine more firmly and with less damage than anything else I have ever tried.



The forceps are made by Messrs. Allen and Hanburys, 48, Wigmore-street, W.

DENIS BROWNE, F.R.C.S. Eng.

Reports and Analytical Records.

EUROSPA.

(S. R. TOOGOOD, 173, KING'S-ROAD, HARROGATE.)

EUROSPA is a cream-coloured powder which claims to possess the curative properties of the salts contained in the natural medicinal waters of Harrogate, Bath, Wiesbaden, and Vichy. On analysis, the following results were obtained:—

Moisture	6·10 per cent.
Matter, insoluble in water ..	9·16 „
Matter, soluble in water ..	84·74 „

The insoluble matter consisted of magnesium phosphate and a little sulphur. The soluble matter comprised sodium sulphate (37 per cent.), magnesium sulphate (16 per cent.), small amounts of potassium salts, tartrates, and citrates, and traces of lithium and chlorides. The sulphur (2·5 per cent.) probably is present as "potassa sulphurata." When dissolved in water the solution was slightly alkaline and had a distinct odour of sulphuretted hydrogen.

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RECENT FOOD INFECTIONS.

LONDON and the home counties have been unpleasantly aware, during the last week or two, of the prevalence of an infectious fever of the enteric group, some 90 cases being under treatment in the M.A.B. hospitals on August 14th. The disease has shown no respect for age or class, and has not been localised to any one area, although certain districts such as Kensington and Epsom have furnished most of the cases. On the whole the symptoms have been mild, the chief being headache and fever. In the average case there has been no vomiting and no diarrhœa, but rather constipation; the majority have shown rose spots in abundance, and a slightly enlarged spleen. Though a few cases have been severe and one death has been reported from Epsom, the outbreak cannot be regarded as really alarming. The organism responsible is *paratyphosus-B*, distributed it is presumed by food; while no particular comestible can as yet be definitely incriminated, cream is under grave suspicion. Since the beginning of the year it has not been permissible to add preservatives to cream and the suggestion has been made in many newspapers that there is some connexion between this prohibition and the present outbreak of infectious fever. A priori this is unlikely, for it has been shown that the maximum addition of boric acid heretofore customary—namely, 0·4 per cent.—has no effect on the growth or vitality of the paratyphoid bacillus, and that five times the quantity is needed to exert any restraint on the organism. It should be borne in mind, also, that in the ordinary course of events paratyphoid organisms in cream originate from the organisms in the raw milk from which the cream was derived. If it were true that they are commonly present in cream, but have hitherto been rendered innocuous by boric acid, then it would be difficult to explain why no milk-borne epidemic of paratyphoid has been recorded in recent years, for no preservatives have been tolerated in milk itself since 1912. This is not to say, of course, that cream, like other foods, may not be accidentally contaminated after separation. Five years ago a big epidemic owed its origin to ice-cream which had been cooled in filthy surroundings.

The paratyphoid outbreak has been confused in the public mind with a group of cases of food-poisoning among the London police force, leading to the death of a constable. But although they were coincident in time the two epidemics were fundamentally different in nature. The usual symptoms of infection with so-called food-poisoning bacilli are vomiting and diarrhœa, the excreta often being blood-stained. There is evidence of intense toxæmia, and the rapid onset, perhaps with prostration, is in marked contrast with the slow and mild development of illness due to paratyphoid-B. Acute enteritis following the ingestion of food used to be described as "ptomaine poisoning," when it was supposed that the symptoms were due to substances produced by the decomposition of proteins, but it is now recognised that the symptoms are due to the multiplication of organisms of the food-poisoning group within the intestine, and in severe cases within the blood stream. The food-poisoning bacilli occurring in preserved meats such as sausages, pies, and the like, may have come from an infected cow or pig, or from subsequent contamination of healthy meat. The meat or food may not present any unusual features either to the taste or smell, although there can often be isolated from it an organism identical with that obtained from the sick individual.

All these infecting agents, paratyphoid bacilli and the food-poisoning organisms alike, however different may be their results clinically and epidemiologically, are closely related and belong to the salmonella group, which comprises a number of organisms which cannot be distinguished from one another under the microscope. Their biochemical characters are also similar and separation of members by fermentation tests is not possible. They differ in their serological relations, but even here the group relationship between certain types may be so close as to demand complicated methods, such as agglutinin-absorption tests for their identification. Of the three types of paratyphoid bacilli, "A" does not occur in this country, "C" is met with occasionally, while "B" infections are common, and in recent years have assumed a greater relative importance than typhoid fever. The food-poisoning bacilli comprise: The *B. enteritidis* of Gaertner, which was found in the recent police cases, and the *B. aertrycke*, the commonest food-poisoner in this country, of which at least four types have been described. All these agree in the essential characteristics that: (1) they multiply in food with great rapidity, especially during warm weather; (2) during their growth in food they produce no physical changes visible to the naked eye; and (3) the toxins produced are highly resistant to heat.

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EXPERIMENTAL DENTAL CLINICS.

IT is generally agreed that in schools and industrial enterprises the dental clinic has proved its worth, and the Minister of Health has taken power, under the Amending Act, to set up a number of experimental clinics for dental treatment under the National Health Insurance scheme. This experiment has a significance both for medical and dental practitioners, since their interests under the Acts are closely related.

The amount of dental additional benefit distributed has steadily increased during two valuation periods, but it seems certain that its present partial and conditional application will extend over the period of the third valuation which is approaching. Notwithstanding the fact that nearly £2,000,000 per annum is available for the purpose, the present scheme is far from covering the entire field. All insured persons are not yet entitled to the benefit; those who are eligible are called upon to pay a large proportion of the cost of treatment, and none can claim it during those important years of adolescence from 16 to 21 years of age. If we ignore these serious deficiencies, it must be admitted that the scheme has been largely successful. A satisfactory system of dental service has been evolved and maintained on a voluntary basis, and this is especially noteworthy because in the original Act there was little provision for regulating the administration of additional benefits, and consequently the conditions of service—including the delicate matter of remuneration—had to be negotiated by conference between representatives of the dental profession and of approved societies in an atmosphere of imperfect mutual confidence. As it now stands the scheme is applicable to England, Scotland, and Wales. It is managed by a Dental Benefit Joint Committee consisting of equal numbers of dentists and approved society representatives, with subsidiary committees for interpretation, investigation of disputes and for appeals; there is a Regional Dental Officer service, and there is even a disciplinary tribunal consisting of a barrister and two dental assessors. No panel in the medical sense is at present in existence, but there has been no difficulty in securing the necessary service, the insured person being permitted to consult any dentist who is prepared to give the treatment on the agreed conditions.[1] A few approved societies have caused trouble by refusing to take part in the scheme, and their efforts to secure treatment for their members at fees lower than those of the agreed scale have had a disturbing effect. There have also been the inevitable clashes caused by lay officials who considered that control of the funds gave them the right to interfere with the professional discretion of the dentists. The latter, on their part, have occasionally shown an unfortunate sensitiveness as well as a somewhat irritating tendency to ignore agreed conditions. But, on the whole, the method of giving treatment through the agency of private dental practitioners seems to have justified itself, and this method is likely to remain the chief means for administering this important benefit. The demand for dental clinics has thus no warrant in any failure of the present system.

By no means new, the suggestion that clinics should be established was familiar to those who had to deal with the approved societies during the first valuation period, when it was put forward by certain officials with the frank intention of getting more effective control over the dentists they wished to employ. The idea was to place one or more dentists in operating rooms in proximity to the offices of the approved society, which would itself settle conditions of service, supervision, and remuneration; in short, it was desired to apply to dental insurance practice the methods of the pre-insurance "medical club" system. When later, on the institution of the present Dental Benefit Joint Committee, the Minister of Health asked the Committee to inquire into "the possibility of the institution of clinics for dental treatment in particular areas and the desirability of encouraging steps to this end on the part of the dental profession," the earlier attitude towards the clinic question was largely abandoned, and stress was laid on the necessity for obtaining for insured persons a uniform standard of dental treatment in return for the payment of a uniform scale of fees. Attention was drawn to the advantages of large establishments, fitted with equipment and apparatus for special forms of diagnosis and treatment, and having facilities for team-work such as were not generally available in private surgeries; the clinic, it was expected, would also act as a propagandist centre for dental hygiene. The setting-up of such institutions is, however, only possible in populous areas, and preliminary inquiries on initial cost and running expenses do not encourage the idea that the present cost of treatment would be materially reduced. Nevertheless it is clear that clinics might play a useful though limited part in the future treatment of insured persons, and the assurances about their control, given by the Minister, and the actual embodiment in the Amending Act of the principle of free choice of dentist, have gone a long way towards reconciling the dental profession to an experiment of which it had been suspicious, as was hardly surprising. It must not be forgotten that the present position of the profession, of whose members only about one-half possess qualifications obtained after recognised courses of study and examination, necessarily results in a certain inequality of service available to those who get their dental treatment under the National Health Insurance scheme. The experimental clinics will test the possibility of providing a high standard of dental treatment in circumstances under which, otherwise, it may not be always available. If insured persons, of their own choice, attend them in sufficient numbers, and if the treatment given in the clinics is maintained at the level of excellence which is contemplated, their establishment will be justified from the standpoint of public health, and, in any case, the experiment, with all its results made freely available to interested parties, cannot fail to be useful.

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NON-PULMONARY TUBERCULOSIS.

SEVERAL important issues are raised in the papers in our present issue, by Mr. J. T. MORRISON on human and bovine types of tuberculosis in man, and by Dr. C. O. STALLYBRASS on the sources of infection. Both deal with non-pulmonary tuberculosis, a type of the disease which is all too often neglected in discussions on infectivity. Mr. MORRISON's inquiry concerns the effects of inoculating guinea-pigs with material from tuberculous lesions, with a view to correlating clinical and bacteriological findings, and in almost one-third of the cases he found that this test was negative. For various reasons it is considered that failure to produce tuberculosis in the experimental animal was not due to the paucity of organisms, nor to a high state of immunity as reflected in the clinical course of the patient's illness; but rather to local conditions, such as the presence of fibrosis in the lesion from which the material was obtained. This view was supported by the long history of some of the cases, and seems by no means unreasonable, since it is well recognised that fibrotic and calcified foci are least likely to yield tubercle bacilli on animal inoculation. It would be a valuable aid to the elucidation of this point if material were inoculated from different portions of the lesions and at different times in the history of the same patient—i.e., in the early active stages and again in the later quiescent stages. An investigation into the human and bovine origin of these cases showed that failure to induce tuberculosis in the guinea-pig was as common with the one type of bacillus as with the other, so that the question of the relative toxicity of the two types of bacillus for the guinea-pig was apparently not considered to require investigation.

Mr. MORRISON raises a number of other questions on the regional distribution and clinical condition of the bovine and human groups. Tuberculous glands of the neck were found to be of bovine origin in 75 per cent. of cases, whilst the bovine bacillus was only responsible for 28 per cent. of the bone cases. These figures emphasise the need for a much more careful geographical survey of both bovine and human tuberculosis. Why, for instance, should Edinburgh have a high percentage of bovine lesions? Again, why should Jarrow, as shown by recent statistics, have a markedly higher total tuberculous incidence than Tyneside in general? Average figures for the country as a whole are of course of the utmost value, but there is some danger in assuming that they are necessarily typical of local conditions, and in so doing a remedial local factor may be overlooked. Statistics, moreover, do not remain of permanent value. Are we not in danger of making false deductions, for instance, from figures of positive findings of tubercle bacilli recorded in milk and butter in periods before the war? Every generation ought to make its own investigation afresh.

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[1] These are set out, together with full information on the working of the scheme, in a Dental Benefit Handbook compiled by the Dental Benefit Joint Committee and obtainable from H.M. Stationery Office at a nominal cost.

There is need, too, in the case of bovine tuberculosis for a regional survey of dairies and milk supplies, and we believe that such a survey might show that the bovine bacillus is not so widely distributed as was at one time believed. On the clinical side Mr. MORRISON's inquiry shows that the history of onset of the disease was earlier in the bovine than in the human bacillus series. This again is important. It is likely that younger children, drinking more milk, are more prone to bovine infection than older children, but we have been led to believe of late that the human type of infection is also contracted during early years. Mr. MORRISON's figures do not quite bear this out as far as non-pulmonary tuberculosis is concerned. A study of family history and an inquiry into possible portals of entry were not very successful as a guide to bovine versus human infection, but the results of treatment in the two types of case were remarkable. In all the bovine cases traced the patients were in good health, whereas more than 18 per cent. of the human cases had proved fatal within three years.

Dr. STALLYBRASS, also dealing with Liverpool cases, gives the results of inquiries into 4469 non-pulmonary cases of tuberculosis. From his figures it appears that tuberculosis of bones and joints is relatively common in patients giving no history of exposure to a human source of infection, whereas meningeal and abdominal tuberculosis—and to a less extent tuberculosis of peripheral glands—was in excess in those giving such a history. These deductions have to be somewhat modified for children, but, broadly speaking, Dr. STALLYBRASS thinks there is a direct contradiction between the figures as analysed for exposure or non-exposure to a possible source of human infection, and between the well-known results of bacteriological investigation. We are not so sure that exposure to human infection can be taken as a crucial test of invasion by the human bacillus. The tubercle bacillus is a slow starter, and the race is not always for the swift; the history of human infection may well be overlooked. The significance of certain details of personal history often escapes even the most skilled questioner, whilst the primary case in the household may remain dormant, from the physician's point of view, for many years. Conversely, bovine infection is rarely in evidence. On the whole, therefore, we are inclined to place most reliance on the bacteriological findings, but Mr. MORRISON and Dr. STALLYBRASS have raised many interesting questions, and are to be congratulated on exploring the field of non-pulmonary tuberculosis as against the pulmonary type of the disease. Far too little original work has been done of late years in this field, and it may well be that investigation of this kind will open up new views on the prevention of tuberculosis, particularly as regards contacts, disinfection, the milk problem, and the like. A large proportion of our national health budget is devoted to tuberculosis, and the elucidation of these questions may result in saving of money.

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RECOGNITION is given in the United States to the social importance of the Registrar-General's Decennial Supplement dealing with Occupational Mortality,[1] by the devotion of a whole Public Health Report[2] to a summary of its facts and deductions. We are thus afforded an opportunity of knowing how others regard the data and their presentation. America possesses no comparable material—nor, indeed, has any other country; and turns with avidity to our occupational mortality-rates as being exceptionally suggestive. The social distribution of mortality, portraying the influence of financial standing upon disease, has little appeal to the United States, except as introducing an element of uncertainty into occupational environment. Possibly a country so prosperous as the United States finds even its lowest social class hardly at all hit by the dysgenic influence of penury. The association is noted of such digestive diseases as diabetes and diseases of the liver with financial capacity for over-indulgence in dietetic indiscretions. Then attention is devoted to specific occupational comparisons in the search for clues to hidden industrial hazards. Here the significance of dust as a cause of tuberculosis, especially of silica dust, is stressed. The evidence adduced receives synchronous support from research just published by the Metropolitan Life Insurance Company of New York,[3] wherein the proportion of deaths from tuberculosis for certain occupations with a silica dust hazard is shown to exceed the average for all males: for metalliferous miners by 83 per cent., for pottery workers by 77 per cent., and for stone cutters by 44 per cent. A point is made that where this specific hazard exists there is a tendency for the phthisis mortality to rise steadily with age, and so present a form of curve unique for this cause of death. The facts are carefully examined as to mortality due to all other respiratory diseases. Occupations with high rates are placed in five groups: one is exposed to dusts; a second to high temperatures—e.g., furnacemen; a third to inclement weather—e.g., dock labourers; a fourth contains rejects from other trades—e.g., costermongers; and a fifth includes the alcoholics. In this connexion the incomparability of death-rates in the two countries ascribed to chronic bronchitis receives attention. In the United States certification of chronic bronchitis is discouraged, so that in New York medical certificates stating chronic bronchitis as a cause of death are sent back for revision. Hence bronchitis death-rates are usually about one-fourth those in England and Wales; while cardiac death-rates are proportionately swollen, since English bronchitis becomes American myocarditis. Direct occupational risks, however, affect a relatively small group of the working population, while the conditions of life implied by various occupations exert subtle and pervasive influences on mortality in many indirect ways. The British data are recognised as providing evidence of the existence of such influences.

INFLUENCE OF POSTURE ON RENAL FUNCTION

THE relation of posture to albuminuria in susceptible subjects has long been recognised, and at one time came in for a good deal of investigation, but evidence on the effect of postural changes upon the renal function is still scanty. Exactly a quarter of a century ago Linnoisier and Lemoine, using the methods then in vogue, adduced good evidence of an increase in the activity of the kidney when the body was recumbent, but in spite of the development of new methods of investigating the renal function their results seem to have gone unconfirmed. N. Cordero and M. H. Friedman,[1] working in the Physiological Laboratories of the University of Chicago, have now reinvestigated the question, using means of the phenolsulphonephthalein test of Rowntree and Geraghty. They employed two normal subjects for their experiments, which extended over seven months, and their results show clearly a diminution of excretion of the dye in the upright and an increase in the recumbent position. They were further able to demonstrate corresponding alterations in the excretion of water. A large body of evidence goes to show that the excretion of phenolsulphonephthalein runs parallel to that of nitrogenous bodies in the urine; Linnoisier and Lemoine demonstrated a decrease in chloride excretion in the upright position and an increase in the recumbent. In view of all these facts the assumption seems fully justified that the recumbent position favours, while the upright inhibits, renal activity. The why and wherefore of this phenomenon remains as obscure as it was when Linnoisier and Lemoine[2] originally produced the theory of torsion of the renal pedicle resulting from erect posture. The American investigators suggest that increased urinary excretion in the recumbent position may be due to increase of the capillary bed, brought about by vascular dilatation. Such a dilatation may depend not only on the recumbency, but also on the general toning-down of nervous activity, such as precedes sleep. In support of this they adduce the fact that in one of their subjects, who was of a nervous and excitable disposition, the influence of change of posture was less than in the other whose nature was more phlegmatic.

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[1] Registrar-General's Decennial Supplement, England and Wales, 1921, Part II., Occupational Mortality, Fertility, and Infant Mortality. H.M. Stationery Office. 1927.

[2] Public Health Report, No. 25, vol. xliii, June 22nd, 1928. Washington.

[3] Deaths from Tuberculosis in Dusty Trades. Statistical Bulletin, Metropolitan Life Insurance Co., vol. ix., No. 6, June, 1928.

THE BROAD TAPEWORM IN NORTH AMERICA.

It was predicted over 30 years ago that *Diphyllobothrium latum* would become endemic in the upper peninsula of Michigan, seeing that its population contained immigrants who retained their Baltic habit of eating uncooked fish, fresh, dried, smoked, or cured. The prediction has proved correct, and T. Vergeer[3] has been investigating the steps by which this established infection is being maintained. Pike are almost solely implicated as the second intermediate host, that directly concerned in infecting man. They are in the main migratory, passing from the Great Lakes into the rivers to spawn, and in this way reaching Portage Lake in the Michigan Peninsula, the spot where infection is greatest. One infected fish has been caught in Lake Superior, 20 miles from the mouth of the Portage Canal, a distance which marks the limit of the area investigated, so far as Lake Superior is concerned. The local crustacean intermediary has not been determined. That the matter may come to have a more than local interest is suggested by the statement that 7,000,000 pounds of pike belonging to the species which are locally infected were imported into the United States from Canada in 1924, the last year for which figures are available, mostly fresh and unfrozen. It is concluded that it is necessary that these imported fish should be thoroughly examined for the plerocercoids of *D. latum*. Knowledge of the extent, if any, to which they are infected [illegible] valuable, but if a complete food inspection [illegible] this would probably be incompatible with [illegible] tinuance of the trade. Nor does there [illegible] justification for its institution in [illegible] stances, seeing that the human infestation [illegible] associated with peculiar habits [illegible] grants of certain nationalities, that [illegible] limited to the area where these habits exist, and that within that area, it is, in the experience of those in local medical practice, less common than it was 20 years ago. It is significant that all the pike, some 30, examined from Lakes Erie and Douglas, were free from plerocercoids of this cestode.

RACIAL VARIATION IN THE SIZE OF RED BLOOD CELLS.

It has generally been accepted that on the average the red cells of all the races of mankind are of the same size, but actual evidence of this has been wanting. Credit is therefore due to Dr. N. G. Winschnewsky[1] for adducing facts in support of this view. He has examined the red cells of 195 people of various races, all of whom had been domiciled for some months in Moscow, and he has found that the average size of the red cells in members of all the races tested falls within the accepted limits of normality. The extreme measurements of the diameter in the individuals examined were 6·64 µ and 7·83 µ, whilst for the different racial groups they were 7·14 µ and 7·34 µ. So far as it goes, this suggests that there is no appreciable difference between the dimensions of the red cells in individuals of different races living under the same conditions.

ACID DRINKS AND ENAMELLED VESSELS.

A FULL account of an interesting but rather alarming outbreak of sickness, which received some notice in the daily press, is given by Dr. J. A. Charles, assistant medical officer of health for Newcastle-upon-Tyne, in the current *Medical Officer*. Fortunately the investigation which followed the outbreak left no grounds of doubt as to the cause or as to the means of avoiding the possibility of similar occurrences.

A firm employing about 500 people were desirous, during the recent hot weather, of adding to the comfort of their employees by providing iced lemonade for their consumption. The "lemonade," like much of the drink provided under that name, was free from the characteristic acid of the lemon and its allies, citric acid; its place being taken by the usual substitute, tartaric acid. It is to the credit of the makers of the powder used that they called it "fruit crystals," and did not use any word suggesting that it was derived from lemons. The report of Dr. J. T. Dunn, who was called in to make an analytical investigation, showed that this was a perfectly harmless preparation, although a [illegible] hospital, made when the first cases [illegible] to the sufferers being treated [illegible] An investigation of the [illegible] outbreak, which was [illegible] recovery of all the [illegible] that the crystals [illegible] overnight in [illegible] for the [illegible] in the crystals [illegible] may be [illegible] case. [illegible]

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[1] Arch. Int. Med., [illegible]

[2] C. R. Soc. de Biol., 1903, [illegible]

[3] Jour. Amer. Med. [illegible]

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[1] Registrar-General's Decennial Supplement, England and Wales, 1921, Part II., Occupational *Mortality*, Fertility, and Infant Mortality. H.M. Stationery Office. 1927.

[2] Public Health Report, No. 25, vol. xliii, June 22nd, 1928. Washington.

[3] Deaths from Tuberculosis in Dusty Trades. Statistical Bulletin, Metropolitan Life Insurance Co., vol. ix., No. 6, June, 1928.

HEALTH TALKS.

In the Public Health Section of the British Medical Association's Cardiff meeting Dr. W. W. Jameson dealt with the important and difficult subject of health education, particularly welcoming the use of broadcasting as a means to that end. He commended the suggestion recently made in *Public Health* (May, 1928) that the present method of broadcasting once a month a "health talk" lasting 15 minutes is unlikely to serve the cause of education so well as more frequent four-minute broadcasts on matters of special health interest at the particular moment. He also spoke of an agreement which had been reached with the General Medical Council in regard to the publication of health articles in the daily press, in which connexion a leading newspaper reported him as follows:—

> "It was now accepted that such articles should be submitted to the Chief Medical Officer of the Ministry of Health for his approval and that approval would be forthcoming provided the article was (*a*) for the public benefit, and (*b*) free from the taint of personal professional advertisement. Articles approved by the chief Medical Officer might be signed by the author and might then be distributed through one of the press associations."

These statements may easily be interpreted as an official decision on the vexed question of signed contributions by medical men to the public press, but the facts do not justify such a reading. For some time past the British Broadcasting Corporation has submitted to Sir George Newman, the Chief Medical Officer of the Ministry of Health, such talks on health as they were proposing to broadcast, with a view to assuring himself that the matter to be broadcasted was for the public benefit and free from the taint of personal professional advertising. It seems that the Central Council for Health Education, a recent development of the Society of Medical Officers of Health, proposed to distribute through the press associations a regular series of articles dealing with health subjects, and asked Sir George Newman for his advice whether the publication of such signed articles would be regarded as unobjectionable by the General Medical Council if the authors were (*a*) senior whole-time medical officers of the public health service who in the ordinary course were not likely to apply for promotion to other appointments; or (*b*) retired medical officers no longer seeking professional employment. The Registrar of the General Medical Council, when consulted, thought it desirable that the same principles should apply to this special series of signed articles as to the special wireless talks, and Sir George Newman expressed his willingness to exercise the same censorship over the publication of articles of this kind as he has done in regard to broadcasting. This is, we understand, the position which has been reached at the moment.

MENTAL DISORDERS IN SCOTLAND.

THE record of last year's care of the mentally afflicted and deficient of Scotland[1] contains no mention of novel departures or striking events, but proves that the foundations of lunacy administration are being strengthened and that healthy ideas are gaining ground. The total number of persons under the Scottish Board of Control at the beginning of this year was 18,702, an increase over last year of 122; this increase is all in the pauper class of patients, the number of private patients having slightly decreased. The number of admissions to asylums was 3168, which is 133 more than in the previous year, but 458 less than the average for the previous quinquennium; 703 voluntary patients were admitted, and 815 were resident on Jan. 1st last. This figure shows a remarkable increase, the average for the ten years 1918–27 being only 409. The average recovery-rate on admissions in all institutions, with the exception of lunatic wards of poor-houses, was about 34 per cent (no general rate is given in the report), and the average death-rate was 8·5 per cent. Most of the deaths were due to diseases of the circulation and brain, and there were only seven suicides. The number of mental defectives on the register was 2915, the admissions being slightly less than in the previous year. In discussing the life of defectives in private dwellings one of the commissioners points out once more that strangers look after them better than their own relatives. This fact is well known to all connected with the care of the mentally afflicted, but its explanation is not at first sight obvious. A patient living with strangers may be removed, and guardians will make strenuous efforts to avoid the stigma which they consider this will entail. Parents, from whom the patient cannot easily be removed, are apt to regard themselves as infallible. Many of these parents, moreover, possess a low intelligence and a rudimentary idea of cleanliness. When aliment is stopped because the family's circumstances have improved or the defective has obtained employment, patients and guardians alike are generally anxious to be free from official supervision. These, however, are the cases in which supervision is most necessary, as the labour of defectives is liable to be exploited.

The Board refer to the success of the observation wards which several parish councils have established and which are conducted on hospital lines. Of 1240 patients who passed through those at Stobhill and Duke-street in one year, 788 returned to their homes without the necessity for certification. The Board are anxious to extend the scheme. As they remark, the Royal Commission of 1927 recommended that the functions of the Board of Control and the General Board should be extended to include all matters relating to mental health. The annual lunacy grant, which amounts to £115,000, is given to improve the care of the mentally afflicted, and this object, in the opinion both of the Scottish General Board and of all who are concerned with the problem, would be better accomplished if, instead of remaining as it is—a grant in aid of certified lunatics—it were given to the Board to use at their discretion for the good of all mentally affected persons other than defectives. It could then be applied to the source of the evil instead of to its full flood, and would be many times more effective.

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[1] Fourteenth Report of the General Board of Control for Scotland, for the year 1927. H.M. Stationery Office. 2s.

is usually so adjusted that the ordinary acid solutions likely to be used in culinary operations only remove inappreciable amounts of antimony in cases where that element is a constituent of the glaze. Antimony was also found in the "lemonade" taken from the pails. Owing to an oversight the liquid from the bath, which it was found was not enamelled with a fritted glaze, but had been painted with zinc white in linseed oil, was not examined, and it is not certain that any of the liquid in this was consumed, although at first there was an impression that those who drank only from this supply were not attacked by sickness. The lemonade from the pails contained 0·013 per cent. of metallic antimony. This, as Dr. Dunn points out, would represent in an ordinary 10 oz. tumbler gr. 0·57 of antimony, or gr. 1·52 of tartar emetic, whilst the emetic dose given in the British Pharmacopœia is gr. 0·5 to 1·0, so that drinking so little as one-third of a tumbler might be expected to cause sickness. No other heavy metals, such as arsenic or lead, were found in the drink, and the circumstances, including the symptoms observed, were all consistent with simple antimony poisoning.

It is unfortunate that so kind and thoughtful an action on the part of the firm concerned should have led to so much pain and inconvenience, but the tale serves to point some morals. Æsthetic and, perhaps, even common-sense considerations seem to suggest hesitation in adapting utensils designed for one purpose to another. The German makers of slop-pails, in glazing their interiors with a rather low-grade antimonial enamel, could hardly have foreseen that in the pioneer country of sanitary science they would be used as containers for beverages. Possibly, having regard to the adaptable character of the Briton, it might be desirable for such vessels, when sold, to bear a label: "not to be used for food or drink." Occurrences of this kind should receive the widest publicity; in fact, there should be some means whereby brief warnings could be compulsorily published in all newspapers. Further, some international standard for food containers might well be considered, as apart from acute visitations of the kind described, it is surely undesirable that the human body should become a receptacle for traces of antimony, tin, lead, arsenic, and other heavy metals. Last week 30 out of 60 of a party of boy scouts and girl guides were suddenly taken ill after having been regaled with cakes and lemonade, and were unable to return to camp until next morning. It is legitimate to wonder whether this outbreak was due to the same cause as the Newcastle one.

THROMBOSIS OF THE SPLENIC VEIN.

THE diagnosis of splenic anæmia is often made in cases which conform only vaguely to what many authorities regard as at best a vague disorder. From the mixed collection of cases grouped together under this name certain examples of thrombosis of the splenic vein have been separated off, principally by Wallgren, whose original paper has already been noticed in our columns.[1] At the discussion on chronic enlargements of the spleen in children, at the British Medical Association's meeting at Cardiff, Dr. Robert Hutchison referred to the occurrence of this condition in children, and described a case of his own; while in a recent article[2] G. Westkott makes a further contribution to the subject. The essential features of these cases of thrombosis of the splenic vein are the occurrence of severe hæmatemesis in association with enlargement of the spleen—which enlargement is less during and immediately after the hæmorrhage—and the absence of any evidence of cirrhosis of the liver or other cause for the symptoms. Westkott had under his care a girl of ten who was admitted with a profound anæmia, due, he believes, to severe infection with the intestinal parasite, *Trichocephalus dispar*. There was a history of hæmatemesis before admission, and a severe repetition of this followed a blood transfusion while she was in hospital. Elaborate investigations were carried out which excluded other causes of splenic enlargement: the blood count showed a severe secondary anæmia with very slow gradual improvement, unlike that following a serious hæmorrhage. In Westkott's paper the part played by the parasitic infection is discussed at some length, and the relation between this and the thrombosis of the splenic vein which was diagnosed is also considered. Operation was not performed, so that confirmation of the diagnosis was not possible. It is believed that thrombosis in these cases is probably the result of some infection, although the possibility of its connexion with the severe loss of blood by the bowel due to the worm infection has also to be remembered. It may be that the primary fault in these cases of splenic anæmia is a thrombosed splenic vein, and the splenomegaly which follows this may be responsible for the anæmia and also for the character of the white cell count, with leucopenia, so frequently found. Westkott does not come to any definite conclusions except to confirm the idea advanced by Wallgren, that splenic vein thrombosis is a clinical entity. The case he describes opens up further possibilities as to the ætiology of the condition.

THERAPEUTIC MIRACLES AT HEREFORD.

IN his History of Hereford Cathedral the late Canon Bannister states that, as a general rule, the miracles recorded in the "Lives" of mediaeval saints are vaguely described and poorly attested. But of those wrought at the tomb of St. Thomas de Cantilupe it seems that there exists an official account, drawn up by six lawyers after investigations made by papal commissioners. Two of these—Ralph Baldock, Bishop of London, and the Bishop of Mende—came to Hereford at the end of August, 1307, and stayed till Nov. 16th, *omni die ex industria intuentes ecclesiam.* Pope John XXII., in the Bull of canonisation, declares that 17 miracles were thoroughly investigated and found to be *fidelibus probata testimoniis.* A large *proportion of these 17 miracles* were cures of cases of palsy, but three deal with cases of blindness, and Bannister says that the evidence for them is probably better attested than the evidence for marvellous cures at any other shrine. The fifteenth of the series concerns Agnes de la Brok, of the parish of St. Martin's, Hereford, cured of blindness on the Friday after the octave of Easter, 1287. One witness affirmed that Agnes was well-to-do, so that there was no apparent reason for her wishing to make money out of her infirmity. Several witnesses deposed that she had not in her blinded eyes, *vulnera, apostema, tumorem, maculam, vel aegritudionem vel aliquam apparentem laesionem.* This seems to have been a case of hysterical blindness. Last in the series of cures come two small boys, brothers, aged 4 and 5 years respectively, healed of their blindness, also in 1287. *Mali humores effluebant ex oculis, et aliquando claudebantur palpebrae dictorum oculorum: tunc ipsi oculi inflabantur, et putredine congregata in eis denuo palpebrae aperiebantur.* Obviously these were cases of simple catarrhal ophthalmia. Presumably Agnes and the children had died or passed out of ken during the 20 years intervening between their miraculous cures and the official inquiry, or their first-hand testimony would have been obtained.

Judged by modern standards one feels that the six lawyers who investigated these cures must have been very easily satisfied, but the inquiry was held upon the findings of papal commissioners, and when St. Thomas de Cantilupe, recently dead, was at the crest of his fame as a miracle worker. For this saint, one of the most celebrated of the Bishops of Hereford, died on August 25th, 1282, at Civita Vecchia. He is reputed to have been of a saintly disposition, and was certainly steadfast and unyielding in upholding the rights of the See. There is, so far as we are aware, an anatomical basis, and he considered that we could attribute little or no importance to the factor of autotoxæmia. There was present an instability of affective mind resulting from heredity and possibly connected with vasomotor variations.

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[1] THE LANCET, 1927, ii., 823.
[2] Jahrb. f. Kinderheilkunde, June, 1928.

Autotoxæmia was of considerable importance in true or idiopathic epilepsy as distinct from symptomatic epilepsy. In many cases it was possible to demonstrate anatomical changes. For instance, Weiner had described gliosis of the cerebral cortex, Chaslin alterations in the cornu ammonis, Speilmeyer leptomeningitis. Endocrine influences might also play a part, the suprarenal, thymus, corpus luteum, and possibly the pineal gland, all tending to increase the instability of the cerebrum and to predispose to convulsions, while the parathyroids, gonads, pituitary, and possibly the pancreas, decreased this tendency. Hepatic influence in mental disorders remained uncertain. Kirschbaum had described degeneration in the corpus striatum and pallidum in the cerebral cortex in association with acute yellow atrophy of the liver. Prof. Weygandt attached no great importance to bodily fatigue and hunger, in the production of mental disease, but insomnia might have a definite influence.

In summarising, Prof. Weygandt stated that in many cases of mental disorder considerably biological and biochemical changes occurred which could be explained by autotoxæmia. The facts discussed had also been applied to treatment. Preparations of thyroid gland were successful in the treatment of myxœdema and cretinism, while results in pituitary disorders had been obtained by X ray applications and glandular feeding. Malarial treatment, successful in many cases of general paralysis, had not yet been found to influence dementia præcox nor epilepsy. Both diagnosis and treatment demanded that investigation of the autotoxæmic influences in psychoses should be regarded as one of the most important researches in psychiatry.

Dr. F. A. Pickworth (Birmingham) brought forward some work which was being done in Birmingham in connexion with the joint Board of Research for Mental Diseases and the Birmingham Mental Hospitals. The question of focal and intestinal sepsis had been studied very carefully. They had found evidence of infection with organisms of the paratyphoid and food-poisoning groups which was considered to have a causal relation to focal sepsis variation in agglutinin response and metabolic disturbance. A special study had been made of the relation of sinusitis of the sphenoid to pituitary disturbance, and pituitary dysfunction might explain some of the symptoms of endocrine deficiency. Dr. Pickworth showed slides illustrating: (1) the sphenoid sinus containing pus, and demonstrating that the pituitary gland had very little protection from the organisms and toxins which invaded the damaged epithelium; (2) a perforation into the pituitary fossa from a sphenoidal sinusitis. Other slides illustrated actual infection of the pituitary fossa, and one showed a number of organisms in a large mass of colloid in the pituitary capsule, suggesting that abnormally large masses of colloid in the pituitary had relation to septic involvement of the gland. Given septic involvement of the pituitary, it was reasonable to suppose that septic products, or at least a perverted pituitary secretion, was able to reach brain tissue.

Dr. E. Mapother (London) thought all were equally agreed that every mental process was only the subjective aspect of a bodily one which left traces and originated habits and reactions. As regards gross endocrine abnormalities and mental disorder, Dr. Mapother thought that the evidence suggested that in most cases, with the possible exception of the thyroid, the association was rather one of frequent occurrences than of causal dependence. He had known dystrophia-adiposo-genitalis coexist with perfect mental normality; similarly, giantism was only occasionally associated with mental defect. Concerning genital glands, he thought that, if we interested ourselves in evidence of functional disturbances rather than gross anatomical changes, the history given by many patients was significant. Sexual disturbances and the psychological reactions arising therefrom, appeared of more psychiatric importance than all the rest of the endocrine disorders. Such conditions as erotism and nymphomania on the one hand, impotence and frigidity on the other, were extremely common, and the reactions arising from these conditions were most important.

Dr. I. S. Wile (New York) considered that the terms toxæmia and psychoses were employed in too broad a sense. They could not disregard heredity, infections, &c. Endocrine disorders and psychoses might be due to a common underlying cause, such as syphilis; concomitant as in association with cerebral tumour and diabetes; or in causal relation as mental enfeeblement and athyroidism. It was necessary to show causal relationship rather than coexistence of symptoms. At present all phases of study were essential to secure material facts from which later generalisations might be made. For many years it would be advisable to accumulate data regarding heredity, infection, trauma, and metabolism. Equally important were the appreciation of the psychological and psychogenetic factors entering into psychoses in relation to toxæmia.

Dr. Mary Barkas (London) advanced the view that the association of physical disorders with mental disease might be explained otherwise than as direct causes, and that the psychiatrist might promote the development of psychiatry far more by concentrating on the study of the mental processes of patients than by a flight into the laboratory. Dr. Barkas thought that plausible explanations of the association of bodily manifestations with psychosis could be offered. She believed that autotoxæmia and similar disorders might be related to mental disorder in the following ways: (1) as a precipitating factor; (2) as a source of mental stress; (3) as joint effect of some primary cause; (4) as chance concomitant; (5) as result of the mental and emotional or psychomotor disorder. It must also be remembered that while they were dealing with those cases of disordered bodily function which were insane, there remained in the general population far larger numbers suffering from similar disorders, but free from mental illness; the speaker held that it was for them as psychiatrists to investigate what were the other factors, lying perhaps in the inherited constitution and temperament, in the individual development of personality, or in the foregoing emotional situation of their patients, which had determined the mental breakdown. The physical disorder might have been the last straw, making a pre-existing burden of a stress intolerable, and its removal might make readjustment possible. Various endocrine defects might produce dwarfism, but many dwarfs were of quite normal mentality, notably achondroplasics, and some forms of pituitary infantilism. Where they were mentally abnormal, might we not equally well suppose that their mental symptoms were a reaction to their bodily abnormality, which produced a sense of inferiority or an attempt to over-compensate for this, cunning or suspiciousness, and an attitude of defence to make up for lack of physical strength, and a whole series of other mental reactions. Until we had studied these mental phenomena in sane and insane alike who laboured under endocrine disorder, we were not in a position to assert that mental symptoms, when found, were directly produced by the metabolic dysfunction.

Dr. R. D. Gillespie (London) said that the conception of autotoxæmia in this country had been restricted largely to conditions of supposed intestinal absorption. The bacteriology of the colon in persons mentally *normal* was in too vague a condition to make it safe to draw definite conclusions from a bacterial examination of the fæces in the psychoses. Similarly, regarding Dr. Pickworth's observations, it was

CIVILIANS AND BOMBARDMENT FROM THE AIR.

THIS week's manœuvres over London and the home counties seem to show that complete protection of a large city from aerial attack is at present impossible. It is a military axiom that means of defence never lag far behind means of attack, but for the moment, given equal forces, there is evidently no way of preventing a capital city from suffering severely by bomb-fire. The contents of the bombs to be used in true warfare are a matter of conjecture, but there is little reason to doubt that poison gas would be freely employed, and it may be of interest to recall the steps that are recommended to neutralise its effects. These were set out recently before the Academy of Medicine in Paris by Inspector-General Sieur,[1] who summarised a scheme agreed upon by the International Red Cross for the protection of civilians. This scheme was drafted in 1925 by a committee of experts—chemists, engineers, doctors, administrators, and workmen. Recognising that it is impracticable to supply everyone with individual protective apparatus of the best kind, it divides the community into two classes, active and passive. Active members—police, firemen, first-aid workers, and the like—receive the best possible equipment; passive members are given cheaper and more simple appliances which may safeguard them under ordinary conditions, but they must chiefly rely on being protected collectively. As a gas attack is likely to include attack by explosives, small bomb-proof shelters should be made to accommodate not more than a dozen persons. Any room, it is stated, can be rendered proof against non-lingering gases by hanging its openings with fabrics steeped in appropriate solutions or specially prepared, but it is better to use tightly fitting panels and maintain, by means of artificial ventilation, a pressure slightly above that of the surrounding atmosphere. The air should be taken from as great a height as possible and filtered mechanically and chemically; in shelters to be occupied by children or the sick and aged there should be a supply of oxygen. Shelters are best established in cellars, and there should be a stout layer of impervious flag-stones or concrete flooring over each, and where possible on each floor of the building. Besides these refuges there should be first-aid posts, special hospitals, and means for the transport of injured persons. Lingering gas imposes a serious problem, as it is highly poisonous and may contain pathogenic organisms. All places contaminated should be immediately cleared of their occupants and disinfected, and the occupants should be taken for bathing and disinfection to special stations, and should be excluded from ordinary shelters. Food and drinking-water should be protected, and municipal water-supplies should be covered with an impermeable mineral flooring, whilst gas and electrical conduits should be guarded against explosives. These provisions, said Dr. Sieur, should all be made in peace-time by committees of military and civil authorities, with representative citizens, for each district. The first-aid corps—in this country presumably composed of ambulance workers and trained volunteers—should be distinct from the disinfecting corps, which should be supplied by the fire brigade where there is one, and recruited from volunteers and local sporting organisations where there is none. He states that the British Red Cross is already training its personnel on these lines, but obviously the population here is wholly unprepared for a modern air-raid, whilst neither individuals nor municipalities are likely to plan their undertakings with aerial warfare in view.

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[1] Bull. de l'Acad. de Méd., 1928, 3e sér., xcix., 680.

GIFT TO RADCLIFFE INFIRMARY.—Mr. W. R. Morris, the motor manufacturer, has given £38,000 for the building of a new maternity home at this hospital. He is the President of the Governing Body.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT CARDIFF.

(Continued from p. 302.)

SECTION OF MENTAL DISEASES AND NEUROLOGY.

AUTO-TOXÆMIA AS A FACTOR IN THE CAUSATION OF PSYCHOSES.

Prof. W. WEYGANDT (Hamburg), in opening the discussion, pointed out that with the advance in the pathological anatomy of the central nervous system, it had become more apparent that mental derangements were cerebral diseases, and that a morbid influence on the brain was the cause of mental disorders. The biological investigation of mental derangements was all the more important as the morbid anatomy of the brain had not fulfilled expectations, nor had experimental psychology or psychoanalysis led to very definite results. Prof. Weygandt then considered in detail the forms of retarded development in relation to metabolism of the endocrine glands. Disturbances of the thyroid gland in childhood led to retarded growth and delayed or absent sexual development as well as to mental retardation. Treatment with thyroid relieved such symptoms; excellent results were also obtained in myxœdema. In Graves's disease removal of a portion of the gland by operation was an important procedure, but thymus and ovarian preparations had also been employed. The speaker referred to the fact that giantism and acromegaly were sometimes associated with idiocy, in addition to Fröhlich's syndrome. In such cases a primary disorder of the cerebral cortex was presumably present.

Prof. Weygandt considered that the thymus had also a relation to mental evolution. Klose had removed the thymus in young dogs and observed that the animals developed obesity and ceased to grow, became stupid, tried to eat wood and stones, and eventually died. H. Vogt had described thymic idiocy in a dwarf, aged 17, with flabby muscles, fragile bones, general tremors, and retarded general development. As regards the suprarenal glands, Addison's disease was sometimes associated with headache, depression, fatigue, insomnia, and deficient memory. Strictly speaking, there was no such condition as an uniglandular disorder, for after the loss of one endocrine gland, changes in the other glands would occur. In mongolism the physical signs were those of retarded development, and might be associated with signs of thyroid or pituitary deficiency. Kafka had shown that the serum in most cases gave a weak but distinct "decomposition" reaction (Abderhalden) of the pituitary gland. Also, the white blood cells were increased, while the viscosity of the blood plasma was decreased. Prof. Weygandt considered that mongolism was not syphilitic in origin. One of the most important problems in psychiatry was to determine the pathogenesis of dementia præcox (schizophrenia). Pathological changes had been found in certain cerebral cells, especially those of the third stratum of the cortex. The fifth and sixth strata might also show atrophic changes. The contention of Mott that degeneration of the spermogenic cells and Leydid cells was the basis of the disorder was not generally admitted. Prof. Weygandt considered that endocrine degeneration, as shown by Abderhalden reactions, was most important, although many held these reactions in doubt. If a disorder of metabolism, and especially of the endocrine organs, affected a brain rendered somewhat abnormal by heredity, conditions were favourable to the development of schizophrenia. Entirely different, in Prof. Weygandt's opinion, were the basic conditions of manic-depressive psychosis (cyclothymia). The inherited factor in this disease was paramount and could be traced in 90 per cent. of cases. There appeared to be no question of signs, it was often difficult to distinguish them from those of an anxiety state. Of particular importance in the differential diagnosis was the character of the headaches and their relation to posture. In neurosis the headache was continuous rather than intermittent, had little or no relation to posture, and was aggravated by mental stress. In true contusion the headache might be associated with giddiness, also related to posture, retardation of mental processes and defective memory for recent events were valuable signs of cerebral damage. It was important to remember that the brain might be severely damaged without fracture of the skull or objective physical signs, and that, conversely, fracture of the skull was not in itself proof of cerebral injury. The signs of subdural hæmatoma were often those of cerebral tumour—papillœdema, hemiplegia, &c.—and the cerebro-spinal fluid might exhibit xanthochromia and fibrin flakes.

As regards treatment in major contusion, relief of intracranial pressure might be obtained, either by lumbar puncture repeated at two-day intervals, if necessary, or by intravenous injection of 50–100 c.cm. of 15 per cent. hypertonic saline. The effect of this latter was to cause shrinkage of the brain by absorption into the blood stream of extravascular fluid contents. The effect was temporary only and the procedure might have to be repeated at intervals of two days. An alternative method was to give a saturated solution of magnesium sulphate (3 oz. in 6 oz. of water) by the rectum; to be effective, this solution should be retained for half an hour. In a series of 80 patients with symptoms of cerebral contusion Dr. Symonds found that 18, or 22·5 per cent., stated that they had made a complete recovery. In cases of major contusion the chances of the patient being able to return to full work were less than 1 in 3, and there was the same chance of total incapacity. In cases of lesser injury, there was an even chance of the patient being able to return to full work, and a very small risk of total incapacity.

Dr. C. **WORSTER-DROUGHT** (London) entirely agreed with Dr. Symonds in his statement that the brain might be very seriously damaged without fracture of the skull, or indeed, evidence of bone injury. In assessing the effects and possible consequences of head injury, far too much stress was laid upon the radiographic appearance of the skull, and if negative, the cerebral injury was often assumed—not only in legal, but also medical circles—to have been slight.

In his experience, the after-effects of what has been described as major contusion were more often severe than not—and personally he would not have placed the rate of complete recovery in these cases as high as 22·5 per cent. Cerebral contusion might lead to localised adhesions between the dura, arachnoid, and cerebral cortex and so give rise to epilepsy—and all without X ray evidence of bone damage. This was strikingly illustrated in one case that came under his observation—a case also noteworthy on account of the excellent result of surgical treatment. A man, aged 28, fell, striking his head on the junction of two tram lines. Three years after the accident his first epileptic fit occurred, there being no previous history of epilepsy. Examination showed a scar in the supra-occipital region, but no other physical signs.

The region of the scar was trephined, and when the piece of bone was removed, the dura on incision was found to be adherent to the underlying cortex. Dr. Worster-Drought had had this patient under observation since the time of operation—six and a half years—and no further epileptic attack had occurred; the patient returned to work and was in excellent health. Equally successful was another case of traumatic epilepsy, due to a lesion that might be described as unusual form of subdural hæmatoma in the posterior parietal region. An interesting point was how long after a head injury could epilepsy appear? In his experience, it had been common for epilepsy to appear three or four years after the accident, and he had met with cases in which the first epileptic attack had occurred 10 and even 12 years after the head injury. As regards treatment of traumatic epilepsy, the conclusion was that in the presence of definite evidence of the site of injury, such as a scar, &c.—even if radiographic appearances were negative and in the absence of other localising physical signs—operation was worth while. He would not advise operation in the absence of physical signs or of some evidence indicating the site of injury. The mental sequelæ of cerebral contusion were often peculiar. One somewhat unusual effect was complete and apparently permanent inability to perform mental work, of which Dr. Worster-Drought gave examples.

Dr. Worster-Drought considered that head injuries in the left frontal region were the most serious as regards prognosis in respect of mental changes. A condition of dementia might result from damage in this situation. He had seen such cases, and one example he described. In view of the fact that W. E. Dandy, in America, had recently excised the right cerebral hemisphere in man without, it was reported, the patient showing evidence of mental change, such injuries to the left frontal region were of interest in its possible localisation of the main seat of intellectual activity. As regards treatment, Dr. Worster-Drought was not convinced of the practical value of intravenous injection of hypertonic saline. The relief of symptoms afforded was somewhat uncertain and transient. He mentioned experiments supporting this contention. He was inclined to regard lumbar puncture, repeated if necessary, as the best means of relieving intracranial pressure. The continued administration of saline substances either by the mouth or rectum might, however, also be of value. For chronic and persistent headache following head injury, when repeated lumbar puncture failed to give permanent relief, Dr. Worster-Drought was in favour of sub-temporal decompression. He had seen several cases in which this operation had given excellent results.

Dr. **WILE** remarked that in children cerebral contusion might lead to changes in personality accompanied by delinquency and epileptic equivalents, resembling some of the sequelæ of encephalitis lethargica. It was necessary carefully to distinguish the headache, giddiness, and various mental disabilities following minor contusion from psychoneurotic symptoms. It was important to apply psychological tests in determining defects of memory, whether visual or auditory, for recent or remote events. The relation of cerebral injuries to later educational disabilities could only be determined by more thorough psychological investigation. Traumatic neuroses might be exaggerated in frequency, but it is wise to be certain that minor mental symptoms were not functional before suggesting that they were the residua of organic disease or cerebral injury. He agreed that emphasis was necessary upon the statement that fracture of the skull was not proof of cerebral damage, and that, conversely, damage of the brain might exist without a fracture of the skull. In order to interpret the actual state of a patient following cerebral injury, it was necessary to know if he returned to his earlier occupation, or was subject to further re-education, or was obliged to change by reason of changing industrial conditions.

Dr. **GILLESPIE** said that the classical psychotic syndromes had no definite ætiological relationship to trauma, and certifiable insanity rarely occurred as the result of head injury. In some cases that had been recorded other factors had been prominent, such as alcoholism, and heredity. Several forms of late after-effects could be distinguished, including traumatic mental enfeeblement and behaviour disorders. The chief difficulty arose in the diagnosis of these defect-states from those of psychoneurosis; nevertheless definite criteria existed, such as slowing of thought, attention defect, and mood disorders. Also the dangerous for him to argue from his interesting findings to the psychoses in general. Regarding intestinal toxæmia, clinical experience with Hirschsprung's disease showed that mental symptoms were usually absent in spite of the extreme intestinal stasis. Ulcerative colitis, in which toxic absorption certainly occurred, was not, as a rule, accompanied by mental changes, whereas mental symptoms often accompanied so-called mucous colitis, in which absorption was probably absent.

Dr. **Helen Boyle** (Brighton) looked at patients from the clinical side: What was the matter with them? What would cure them? How long would it be? It was encouraging that Prof. Weygandt mentioned recovery in dementia præcox, and clinicians would agree with him that some such cases appeared to recover. His paper suggested a hope that some test might serve to differentiate these cases from others. It was not satisfactory to assume merely that should recovery occur, the diagnosis was wrong. With regard to manic-depressive states, Dr. Boyle said that many patients seemed to show an association with Graves's disease. This was more obvious in the early stages, but even in confirmed cases the description of excitement, tendency pyrexia, rapid pulse, sweating, and other symptoms suggested hyperthyroidism. There was not infrequently an enlarged thyroid. When this phase subsided, the picture often suggested hypothyroidism—as though the thyroid was fatigued and could do no more. There was depression, weight increased, the patients were slow and weary, with lack of interest, and in exactly the reverse of their previous states.

Dr. **E. Goodall** (Cardiff), the President, remarked that many acute and recent cases of mental disorder improved in large measure with a preliminary enema or colonic lavages. In Cardiff they had published from the Mental Hospital laboratory work upon the distribution of the various nitrogen constituents of plasma, cerebro-spinal fluid, and urine in some 40 (mostly recent) cases of mental disorder, and the results appeared to point to anomalies of protein metabolism. With regard to blood chemistry, the methods for the estimation of blood substances were at present far from adequate. Reliable methods for the estimation of glucose alone had still to be elaborated; also with cholesterol, the statements published regarding a diminution or excess of blood cholesterol in epilepsy and at the menstrual period were unreliable. Some 15 years had passed since Fauser published his results with the Abderhalden reaction in cases of dementia præcox and other mental disorders. His results at that time were mainly confirmed, and there seemed to be evidence that a positive reaction was obtained by Abderhalden's method with cerebral cortex and gonadal tissue in dementia præcox. Of late years one had heard and read little or nothing of the Abderhalden reaction in psychiatry, so that it was of interest to hear Prof. Weygandt's opinion that this method gives a positive result as regards blood and cerebro-spinal fluid in dementia præcox, not only of cerebral cortex and gonads, but often with thyroid and pituitary. If this were so, a means of diagnosis between true dementia præcox, and other mental conditions resembling it, should be established. The difficulty of carrying out the test no doubt accounted for its general non-employment.

Cerebral States Consequent upon Head Injuries.

A discussion on the differential diagnosis and treatment of these states was opened by Dr. **C. P. Symonds** (London). Apart from the immediate surgical risks of compound fracture, rupture of a meningeal artery, and subdural hæmatoma, the severity of head injury varied according to the nature and amount of damage sustained by the brain at the time of injury. When such injury did not prove fatal, there would result cerebral symptoms the differential diagnosis and treatment of which the speaker proposed to discuss. Concussion might be defined as a condition of subtotal cessation of cerebral function following immediately upon an injury, with subsequent complete recovery within 24 hours, at the end of which, in an uncomplicated case of concussion, recovery should be complete. The symptoms were probably due to temporary vascular embarrassment. Distinct from concussion, though often associated with it, was the condition of cerebral contusion. The symptoms of cerebral contusion depended upon two factors: (1) the effect upon intracranial pressure, and (2) the site of the lesion. The focal signs of the latter were those of cerebral disease generally. The effect upon intracranial pressure depended upon the amount of hæmorrhage and exudation. For the purposes of clinical description, Dr. Symonds distinguished between a major and a minor degree of contusion. The major form was almost always associated with concussion; after a few hours the patient partially regained consciousness, but instead of progressing towards normal, he remained stuporose, restless and irritable and might be noisy, hallucinated and even violent. This condition might persist for some days or weeks, the tendency being towards gradual improvement. Lumbar puncture and the application of a manometer might show the presence of increased intracranial pressure; the cerebro-spinal fluid might be blood-stained, indicating capillary hæmorrhage. In minor contusion, the injury might or might not cause concussion. It was possible for a glancing blow to contuse the brain, without loss of consciousness at the time of injury. Symptoms might follow directly upon the injury, but more usually developed after a latent period varying from hours to weeks. The three symptoms most constantly present were headache, giddiness, and mental impairment. A characteristic feature of the headache was its relation to alterations of posture. The mental symptoms consisted of defective memory, inability to concentrate, decreased emotional control, and mental fatigue. Apart from focal physical signs which were rarely encountered, there were other conditions such as epilepsy and permanent mental change which must be related to local damage. Minor degrees of mental impairment—e.g., memory defects—were frequent, but permanent mental deterioration necessitating institutional treatment appeared rare. Epileptic atacks might occur even in the early stages of a major contusion and were probably due to subarachnoid hæmorrhage; attacks developing after a latent interval of months or years were of more serious significance. Cerebral abscess following a compound fracture, and chronic subdural hæmatoma, although both rare, were two sequelæ of head injury which the neurologist was likely to encounter. In subdural hæmatoma the patient began to complain of headaches usually several weeks after the original blow. Other symptoms of intracranial pressure gradually appeared, with stupor and finally coma. Owing to the long latent period and possibly trivial nature of the original injury the diagnosis was sometimes mistaken. The cerebro-spinal fluid might be found to contain altered blood-pigment and flakes of fibrin. Finally, there was a considerable number of cases in which the disability following head injury was wholly or partly of a neurotic nature and usually based upon the problem of compensation.

As regards diagnosis, Dr. Symonds said that during the first 24 hours it was impossible to make a comprehensive diagnosis owing to the state of concussion masking what lay behind. If, however, after partial or complete recovery of consciousness the patient sank again into true coma, or paralytic signs developed, arterial hæmorrhage was almost certainly present. The absence of concussion did not exclude the possibility of symptoms of contusion or subdural hæmatoma developing at a later stage. Stupor and irritability after the first 24 hours indicated major cerebral contusion. A patient might apparently recover and yet develop symptoms of minor contusion after several weeks. Since the symptoms of minor contusion were as a rule unassociated with physical

Early Treatment of Psychosis in Psychoneuroses.

Dr. Helen Boyle (Hove) said that the discussion divided itself naturally into two parts: (1) the early treatment of the individual, and (2) how we could best obtain it. It must be recognised that insanity began before a person was insane. Many, if not most, of the difficulties met with in education, criminology, religion, industry, and general medicine, could only be solved with the aid of mental medicine—an understanding of the mind of man, in health and disease. No doctor would admit that an understanding of the body in health was foreign to his purpose of grappling with disease. No doctor should any longer admit that an understanding of the mind in health was redundant, and still less of the mind diseased. The intricacies of its connexion with the body still needed further elucidation. The early treatment of recent cases in mental hospitals had improved immensely of recent years. The hospitalisation of asylums was progressing apace, but she wished to consider not the certifiably insane treated in mental hospitals, but the patients whom it was harmful to certify or who were uncertifiable, the large number of the maladjusted, the patients labouring under obsessions, phobias, inhibitions, and so on. These were the cases for whom early treatment was so necessary if they wished to prevent the faulty adjustments, criminals and others. Dr. Carswell was the pioneer who started wards for borderland patients in connexion with the poor-law, Dr. Boyle believed, in 1904. The Lady Chichester Hospital was the first hospital for these cases, and started in 1905. The pioneer in providing out-patient facilities was the late Dr. Rayner, who with energy and foresight, about 1889, induced the governors of St. Thomas's Hospital to open an out-patient department for early mental cases. Since then, many others had followed suit.

Still earlier than those cases they had been considering were the children who show maladjustments in school life or before, and for them the child guidance clinics offered useful help. They are, as before stated, the first line of defence. Two are already in existence in England, and an elaborate one in London is being planned with American help.

Finally, Dr. Boyle said that she would suggest that it was desirable: (1) that every general hospital should have facilities for treating early nervous and borderland patients; (2) that child guidance clinics should be available for the young maladjusted children and be under the charge of doctors; (3) that delinquents should have expert examination with regard to their mental adjustment—on the first offence—repeated if necessary; (4) that voluntary boarders be allowed in county mental hospitals; (5) that early insane patients should be able to be treated on two doctors' certificates; (6) that vocational guidance should be available for all who wish it—as at the National Institute for Industrial Psychology—as a preventive measure against maladjustments and unrest; (7) that every medical student should be obliged to devote some time to the study of all forms of mental disorder; (8) that examining boards should require evidence of knowledge of all forms of mental disorder. It was better to pay for this than for insanity, delinquency, unemployment, and industrial unrest.

Prof. Weygandt said that one of the chief difficulties was the recognition of pre-morbid cases. In the commoner types of mental disorders there was an inherited predisposition—e.g., schizophrenia, cyclothymia—and even in early youth latent symptoms might exist. These it might become possible to detect by biological and psychological methods. There had already been several attempts to investigate children liable to mental disorder. At Hamburg they had a clinic for the observation and treatment of psychopathological boys by specially trained medical men and teachers.

Dr. Wile said that the prevention of psychoses and psychoneurosis should be undertaken in childhood to be adequate. From experiences at his own clinic at the Sinai Hospital, New York, he had found that much of the work could be carried out in an out-patient department. The problems met with could be classified under the following headings: (1) social maladjustments, which grew out of social nonconformity; (2) inadequate and undesirable habit-formations—e.g., insomnia and night terrors; (3) personality trends—e.g., timidity, selfishness, and seclusiveness.

Dr. Mapother agreed that in smaller country towns an out-patient department or a ward might be all that was attainable, but it did not follow that such an arrangement was the ideal. In advocating the psychiatric clinic wherever possible as against the policy of a ward or department in a general hospital, he laid stress on points: (1) that it was wise not to rationalise into laws of nature restrictions and separations and vested interests which had really grown up from the absurdities of the Lunacy Act of 1890; (2) the tendency of every progressive country in Europe was towards establishment of special clinics; (3) detailed knowledge of attempts in Great Britain to establish psychiatric treatment in general hospital wards was evidence of their inadequacy.

Dr. Barkas said that it was too often assumed that early and recoverable cases were necessarily mild ones, not needing the resources of a mental hospital for their treatment; this was far from being the case, for it was just those eminently recoverable acute cases who broke down rather suddenly, without such prodromal signs as were likely to be noticed, who formed the group in which prognosis was best, while those of more insidious onset were, unfortunately, quite often the most intractable. An extension to all patients of the provisions now available for private patients, with adequate supervision by the Board of Control, a thing no general hospital was likely to welcome, would do much to supply all that was needed for the present. Child guidance clinics had shown how greatly the problem of the psychopathic child was bound up with social considerations, and how all-important was the social worker in the re-education of the family. The same applied to the adult neurotic; and Dr. Barkas believed that no clinic for either in- or out-patient treatment would be able to do satisfactory work unless it included a well-trained staff of social workers who could deal with the environment of the patient.

Dr. R. G. Gordon (Bath) considered that an intensive study of the personalities of individuals was necessary whether sound or sick, and that particular attention should be paid to the capacity and success enjoyed by adjustments to environment. If this was done he suggested that it would be found that the person who under certain conditions, whether of toxæmia, endocrine disturbance, mental conflict or emotional shock, broke down into a psychosis, differed in his "personality make-up" from another patient who under similar conditions developed a neurosis. Moreover, he would suggest that one of the chief differences was, that in the first case the personality had no real tendency to adjust to the environment, and that in the present state of our knowledge our efforts scarcely increased this adjustment. With greatly increased knowledge we might be able to foresee that under certain circumstances which might be avoided. "A" would break down into a psychosis of a particular kind, say manic-depressive insanity; "B" into a psychosis such as dementia præcox, and so on; while "X" would break down into a neurosis of a certain kind, say, an anxiety state; and "Y" would develop hysteria, and so on. He could not affirm too strongly that this was an ideal situation, and that at present probably no one pretended to be able to carry out such subtleties in diagnosis; yet increasing experience seemed to be pointing that way.

patient should invariably be considered as a whole, especially his previous personality.

Mr. **Wilfred Trotter** (London) said that until recent years a whole train of symptoms following head injury had been regarded as vaguely due to hysteria, malingering, &c., but that such symptoms had been brought under scientific observation and were no longer so vague and indefinable. It was possible to distinguish as precisely as anything in medicine a form of amnesia that was characteristic of true concussion. This was retrograde amnesia—a loss of memory for events preceding the accident, the patient having no recollection for anything that occurred during the 15 to 20 minutes that preceded his head injury. A further point of importance in diagnosis was that in the headache following minor contusion the patient when free from such headache felt perfectly well; this was not the case with the psychoneurotic.

For intractable headache following minor contusion a decompression operation was indicated. In major contusion, Mr. Trotter doubted if one was justified in leaving the brain in a seriously congested condition over a long period. He advocated the special operation of making a small opening in the skull to interrupt the vicious circle of compression.

Dr. **D. McAlpine** (London) confined his remarks to the question of treatment. Increased intracranial tension was brought about by traumatic œdema or hæmorrhage, or a combination of both. Œdema resulted in a general enlargement in the size of the brain which tended to bring its surface close up against the dura. The effect of this was to hinder in varying degrees the absorption of the cerebro-spinal fluid into the venous sinuses, but as the cerebro-spinal fluid continued to flow from the choroid plexuses and accumulated in the ventricles and basal cisternæ, more and more pressure was brought to bear on the medulla until it became paralysed. In some cases, therefore, traumatic œdema resulted in death from medullary compression, and this was a fact that could not be overlooked from the point of view of treatment. Lumbar puncture afforded an easy means of reducing the tension, and was practically free from danger in cases of head injury, excepting in the stage of shock. As long ago as 1905, Quincke pointed out that in brain injuries the estimation of the cerebro-spinal fluid pressure was of importance, and that the best results were obtained by drainage. Until recently little importance had been paid to the principles underlying this observation. A rise of blood pressure accompanying intracranial tension was true only of the late stages of medullary compression, and should not be relied upon as an early sign. The only sure guide to the tension of the cerebro-spinal fluid was the manometer. The normal reading of the cerebro-spinal fluid pressure lay between 6 and 8 mm. of mercury. When the stage of shock following a head injury had passed, and no immediate surgical interference was called for, lumbar puncture should be performed and the tension of the fluid measured. If this was raised, sufficient fluid should be allowed to drain away until the tension was reduced to just below normal. The puncture should be repeated at the end of 12 hours in any case of severity, and performed daily until the tension returned to normal. If after two or three punctures it was found that the tension was increasing, then the possibility of cerebral decompression should be considered.

Dr. **G. Riddoch** (London) said that it was important to separate anxiety states from those of post-traumatic defect. The latter were of the order of a mild dementia—deterioration of general mental capacity. The patient's symptoms tended to become worse towards the end of the day, whereas in anxiety states the symptoms were usually most pronounced in the morning. The symptoms were mainly those of lack in mental and physical efficiency and were an indication of the effect on the brain as a whole rather than a sign of local contusion. Mr. Trotter had suggested the term "post-contusional submentation" to indicate this condition. Dr. Riddoch considered that hypertonic saline was of value in relieving intracranial tension, but that the method should be used with discrimination; it should be given preferably per rectum.

Dr. **E. Mapother** (London) was surprised that various speakers whose experience of head injury was larger than his own should have found acute and severe psychoses so rare a sequel of head injury. He described three such cases directly following severe motor-car accidents. The salient feature in all three was a manic state, a joyous satisfaction with self and circumstances and disjointed hyperactivity. This was associated in a manner that one did not see in ordinary mania with confusion. Disorientation and amnesia for current events was also present; in fact, all three cases somewhat resembled a combination of mania with Korsakow's syndrome. All the patients recovered within a few months. Their condition was certainly not of purely emotional origin, and the patients had never shown previously a neurotic or psychopathic disposition.

Dr. **Pickworth** said that the connexion between head injury and mental disease was found in local or general cerebral anoxæmia or the results consequent upon inadequate removal of metabolic waste products. There was a remarkable similarity in some of the mental symptoms which might occur in chronic subdural hæmorrhage, simple anoxæmia and anoxæmia produced by carbon monoxide poisoning. Almost any symptoms of mental disorder might be reproduced by this condition. A history of head injury was by no means rare in mental hospitals.

Mr. **Geoffrey Jefferson** (Manchester) added his testimony to the importance of the condition of retrograde amnesia which Mr. Trotter had mentioned. Another point was the anatomical basis of contusional states, be they recent or remote. Histological study of fatal cases showed minute though widespread change. He believed that lesions of a similar but lesser degree existed in those patients who finally recovered. The outstanding feature of the finer changes in the brain tissue was cerebral œdema, so that the perivascular sheaths were distended or ruptured. The question of treatment was based largely on pathological anatomy and its physiological results. If gross hæmorrhage was present the treatment was obvious. It was the œdematous cases which presented the chief difficulty. A great change had occurred in the surgical treatment of head injuries, a change from indiscriminate surgery to one of almost complete conservatism. Mr. Trotter had done a service in voicing his doubts as to whether they were right in allowing patients to lie for long in a condition of restless unconsciousness, and there could be no question that judicious surgery held a place in treatment. If one could be sure that the brain was œdematous, hypertonic solutions (and 50 per cent. glucose rather than saline was preferable) should succeed. But if a temporary improvement was followed by relapse, decompression should be done.

Dr. **R. Fager** (Exeter) stated that during the war he had had the opportunity of studying a large number of cases with mental symptoms of varying degree following head injuries. Headache was an almost constant and distressing symptom; usually, but not invariably, it was referred to the site of injury, and was aggravated by stooping. The pain might be so depressing in character that the patient sought refuge in alcoholic bouts and even suicidal attempts. Other common symptoms were restlessness, irritability, lack of concentration, and even hallucinations.

Epilepsy occurred four times more frequently in severe injuries than in those of a superficial character. Cases in which memory defect was a conspicuous feature were mainly in the frontal region, but there appeared to be no relation between the degree of amnesia and the severity of the injury. Mental symptoms were the direct result of the head injury in a small proportion of cases.

instances of non-tuberculous conditions such as tabetic spine, chronic traumatic arthritis, Kümmell's disease, Perthes's disease, *pied forcé*, fibro-sarcoma of the femur, &c. He illustrated these and other conditions by a series of lantern-slides. In conclusion, he said that injury to a tuberculous joint did lead to recrudescence of the disease, but emphasised his opinion that trauma was not a common cause of tuberculosis in cases where a quiescent focus had not previously existed.

Dr. Otto May (Prudential) dealt with the matter from the point of view of accident insurance. He agreed with most of Dr. Tattersall's statements. Mr. Milne, he said, had shifted the discussion to another plane, and had maintained that we must question the diagnosis of traumatic tuberculosis in nearly every case. But the employer is still liable for compensation claims whether the condition is tuberculous or not, so that, in compensation cases, the exact diagnosis was not really a matter of first importance. Dr. May classified traumatic tuberculosis for the purposes of accident insurance and compensation under four headings: (1) recrudescence of a pre-existing focal lesion; (2) miliary tuberculosis following trauma at the site of a tuberculous focus of disease; (3) tuberculosis arising at the site of an injury without a history of previous tuberculosis; and (4) cases in which pulmonary tuberculosis arises after an injury to some other part of the body. In a court of law, he said, one can only give an opinion as to the possibility of the accident having caused the disease, but provided that one did not assume the pose of pontificial infallibility, a touch of dogma was of more practical help in the dispensation of justice than the cleverest exposition of scientific agnosticism.

During the discussion which followed the reading of the papers, Sir Robert Philip (Edinburgh) suggested two practical points in dealing with accident cases. In the first place, a series of radiograms of the affected parts and of the chest should be taken at short intervals and, secondly, many patients had cause to bless the accident, because it brought a smouldering tuberculous focus into view, and by early treatment and the care that was taken in compensation cases, many valuable lives were saved. —Dr. Alexander Brownlee (Cardiff) thought that the percentage of cases following injury was higher than the figures given by Mr. Milne. In a series of his own cases he had found 32 per cent. of cases of hip disease, 33 per cent. of spine cases, 22 per cent. of knee cases, and of other joints 25 per cent. gave a history of injury. He agreed that it was doubtful whether trauma to a previously healthy person could set up tuberculosis in the injured part, but thought that probably the majority of the population was pathologically, although not clinically, tuberculous. "Bridge" symptoms were important in compensation cases, especially if occurring within six months following injury to the knee, within 12 months after trauma to the hip, and in the case of the spine, within two years. However, one could not dogmatise on this point.—Dr. Cecil Wall (London) said that repeated multiple minor traumata, fatigue, and mental anxiety could all help in the activation of a dormant tuberculous focus. There was little difference, he said, between minor multiple traumata and fatigue.—Dr. James Crocket (Glasgow) regarded both mental and physical strain as instrumental in exacerbating tuberculosis.—Dr. H. V. Cantor (Cheshire Joint Sanatorium), in discussing tuberculosis following war injuries, said that the Ministry of Pensions did not consider claims in cases diagnosed as tuberculous within the last two years.

Dr. Tattersall, in reply, said that he was gratified that a blow had been struck against the theory that tuberculosis was implanted on injured previously healthy tissues. In reply to Dr. Cantor, he said that the Ministry of Pensions had been very generous in their treatment of ex-Service men.—Mr. Milne did not agree with Dr. May that the diagnosis was not important in compensation cases. He regarded it as essential both from the point of view of treatment and of compensation.

Factors in the Biochemistry of Tuberculosis.

Dr. L. S. T. Burrell (London), in reading a paper on the therapeutic value of the heavy metals in pulmonary tuberculosis, referred briefly to the use of copper and lead, and to the reactions following the use of such metals as well as of other shock-producing agents such as serum, tuberculin, protein, sun rays, &c. In the use of gold, and especially of sanocrysin (double thiosulphate of gold and sodium) he emphasised the point that the reaction following an injection was similar to that produced by the other shock-producing agents, but that it differed from them in its effect, in that the reaction was followed by the disappearance of tubercle bacilli from the sputum, and by diminution in the amount of sputum. The chief indications for the use of sanocrysin were (1) in cases where the amount of sputum containing tubercle bacilli persisted in spite of other forms of treatment, and (2) in cases of bilateral disease, where it could be used in conjunction with artificial collapse of the more extensively diseased lung. He usually commenced with a dose of 0·1 g. followed three days later with one of 0·25 g. Then, at weekly intervals, he gave doses increasing from 0·5 to 1 g. until the patient had had 5 or 6 g. The complications, such as albuminuria, a metallic taste in the mouth, stomatitis, erythematous rashes, and febrile reactions, had not been serious or of frequent occurrence. In conclusion, he said that he regarded sanocrysin not as a specific against tuberculosis, and certainly not as a cure, but as a useful addition to other methods of treatment.

Dr. J. Clifford Hoyle (Cambridge) read a paper on the serum calcium in experimental tuberculosis. Changes in the calcium metabolism had long been recognised to be associated with tuberculosis, and earlier observers had maintained that "demineralisation" occurred during the disease. No sound evidence existed for the belief that decreased calcium retention took place in tuberculous infections, except possibly in the terminal stages. This fact could probably be explained as being due to infection with secondary organisms. To support this view he gave the results of some interesting experiments carried out on rabbits. He had observed a striking difference between the serum calcium estimations when intraperitoneal as opposed to subcutaneous inoculations of bovine tubercle bacilli had been made. In the former the disease became generalised without an ulcer at the inoculation site, and in these cases little change was observed in the serum calcium curves, but in the latter where an ulcer infected with secondary organisms formed, the serum calcium fell steadily. If the ulcer healed, as sometimes happened, the serum calcium rose again, even while the generalised disease became steadily worse. Septic infection in previously normal rabbits also produced a considerable fall in the serum calcium.

Dr. W. H. Tytler (Cardiff) gave the results of his work on the "tuberculin-active fraction of the tubercle bacillus." He referred at length to the work of previous observers, especially of Long and Siebert. His own work had been primarily concerned with the production of a highly active preparation for experimental work. His methods of preparation were, in principle, similar to those of other workers, and his product was not a newly discovered substance, but was a highly active fraction with some practical application. The substance, obtained by the method of which he gave full details, was non-dialysable, and consisted of protein with a small admixture of proteose. Then nitrogen content varied from 11 to 12·5 per cent. The active fraction used for skin reactions gave a more sharply defined reaction than tuberculin, particularly at low concentrations. It might be stored in dry form, was accurately

Dr. J. R. REES (London) said that there were comparatively few who realised that the moral disorders, the character and personality defects of childhood, were the forerunners of much of the mental disorder of later life. Psychology should be studied in the nursery and in the infant school, and the general practitioner was the ideal person to tackle this early period. He had the entrée to homes and the confidence of patients. He asked if the B.M.A. could not initiate a campaign of education. The mental hygiene movement in America did a vast and altogether admirable work which was practically left untouched in this country. The general practitioner, with his experience and balance, was well able to get hold of the essential facts that were known, and would in consequence be infinitely better equipped to deal with the earliest manifestations of trouble and to do preventive work of inestimable value. Clinics, early treatment centres, and child guidance centres must come, and it seemed to him essential that the profesion should have adequate knowledge if it was to coöperate adequately with these specialised institutions.

Dr. GOODALL (the President) said the delay in dealing with the recommendations of the Royal Commission on Mental Disorders in respect of facilities for early treatment was deplorable. He detailed the arrangements at Cardiff for dealing with early cases in an out-patient department of the Cardiff Royal Infirmary during the past seven or eight years. Dr. Goodall stated that the 30 to 40 per cent. of patients amongst the direct admission to the Cardiff Mental Hospital who were annually discharged within six months of admission could—the majority of them—be treated at a psychiatric clinic, quite apart from the lunacy laws as at present constituted, and all the drawbacks which those laws implied. His constant advice to the Cardiff Local Authority was to rigidly abstain from any addition to their mental hospital, and to concentrate upon provision, in conjunction with the Cardiff Infirmary, of a fully-equipped clinic in psychiatry.

Dr. DORIS ODLUM (London) desired to emphasise most strongly that the provision of a psychiatric out-patient department in association with a general hospital was most valuable, not only in the interests of patients, but also as a means of educating the public, nurses and doctors in other departments of the hospital. Adequate social service in connexion with such a department, and specially trained welfare workers were also essential.

Dr. W. A. POTTS (Birmingham) said that the two most important centres for early treatment to be carried out were: (1) the infant welfare clinic, which provided the earliest opportunity for the examination and training of the child; (2) the antenatal clinic, where the attitude of the mother, and also of the father, to life, and also to the child, might be investigated, and, if necessary, adjusted. It was necessary to correct any misunderstanding that might arise from what was said about the damage of a sentimental attitude towards delinquents, by saying that those who were engaged in work with delinquents were out for justice, and for an opportunity for developing and drawing out the diminished sense of responsibility many delinquents had.

Dr. R. S. ALLISON (Ruthin) referred to some physical aspects of the treatment of the psychoneuroses. From the physical standpoint the first essential after a careful history was a thorough physical examination, and following this, investigations along bacteriological, biochemical, and radiological lines. The object in making these investigations was twofold: (1) the search for toxic foci, (2) to ascertain the physical peculiarities of the patient. The teeth, the throat, the accessory sinuses of the nose, the appendix, the gall-bladder, the colon, the urine and fæces were commonly the sites of a latent infection. In many cases this might be only detected after a thorough investigation of the case.

Dr. C. FORBES (Aberdeen), speaking as a general practitioner, desired to support strongly Dr. Rees's suggestion regarding the education of the profession. The proposition should be urged by all who were interested in the early treatment of mental and nervous illness. There was a definite need for the institution of clinics as a medium not only of research and treatment, but also for the education of family doctors in the particular area served.

SECTION OF TUBERCULOSIS.

RELATION BETWEEN TRAUMA AND TUBERCULOSIS.

Mr. H. MORRISTON DAVIES (Ruthin) was in the chair, when Dr. NORMAN TATTERSALL (Leeds) read a paper on the relationship between trauma and tuberculosis from the physician's standpoint. He considered that inoculation tuberculosis, such as butchers' and pathologists' warts, and acute generalised miliary tuberculosis following such injuries as a blow on a tuberculous testis, forcible movement of a tuberculous joint, and operations on tuberculous glands came into the category of traumatic tuberculosis. In 300 cases of pulmonary tuberculosis he found six cases in which trauma was suggested as the exciting cause, and in four of these, very definite symptoms had bridged the gap between the injury and the onset of the pulmonary lesion. He regarded as satisfactory Parkes Weber's classification of such cases into (1) those in which no tuberculosis was suspected prior to the injury, and (2) those in which tuberculosis was known to exist before the accident. An injury rarely produced a state of lowered resistance to the implantation of tubercle bacilli, and the more probable explanation was that the injury had activated an existing focus of disease. To support this contention he instanced the work of Opie and others who had isolated tubercle bacilli from gland and lung tissue which showed no naked-eye evidence of tuberculosis. Further, accidental wounds in tuberculous patients healed readily. Although injury to the chest might give rise to any form of pulmonary tuberculosis, the disease did not necessarily start on the same side as the injury. Compression injuries were more potent in exciting pulmonary tuberculosis than penetrating wounds. The course of the disease subsequent to injury might be acute, subacute, or chronic. Such symptoms as pleurisy and hæmoptysis were of great importance in fixing the date of onset, but it was very important in the assessment of claims for compensation that "bridge" symptoms should be present between the injury and the diagnosis. He suggested the following questions as helpful in arriving at a decision.

1. Was the patient actively or passively tuberculous before the accident, and if the former, what was his expectation of life?
2. Is the fact of injury definitely established, and was it of such a nature as to be likely to damage an active or quiescent lung focus?
3. What period of time elapsed between the injury and the diagnosis, and was the period covered by bridge symptoms?
4. Is the present condition of the patient and the course of the disease such as might be expected if the injury had reawakened or aggravated an existing latent focus of disease?

Mr. ROBERT MILNE (London), in discussing the question from the surgeon's point of view, said that whereas trauma may lead to a wound and to the implantation of tubercle bacilli in the damaged tissues, weakness from unsuspected tuberculosis, as for example in the knee-joint, may also lead to an accident. In some cases trauma may give rise to an infection of the injured part with tubercle bacilli from the blood stream, but, in his opinion, the percentage of such cases usually given (30 per cent. according to some authors) was much too high. He would put it as low as 2 to 5 per cent. Modern diagnostic methods had shown that many of the so-called tuberculous lesions following trauma were culosis. In his opinion, the expenditure of time and money had not been justified. The mortality from tuberculosis in 1821 was 25 per cent., in 1871, 12 per cent. So that, at a time when no preventive measures had been taken, the mortality had fallen to half. Since then, with the advent of the campaign, the mortality had fallen only 3 per cent. He explained this as being due to the fact that tuberculosis was an epidemic disease and that, as in all epidemics, the virulence of the bacillus had been greatly attenuated until the disease was now very mild, and in fact endemic. In 50 years' time it might again become epidemic. Immunity in his opinion was inherited, and by way of illustration he cited his experience among negroes who had come to the East-end of London. In one half-caste family he had observed that the boys, who all had a touch of the "tar-brush," died from tuberculosis, whereas the girls, who had inherited mostly the characteristics of the white parent, were still alive. We should aim at producing a race immune from tuberculosis. Before people marry they should look into the family history as well as into the banking account.

Dr. R. CAMERON (Cardiff) said that early diagnosis was sometimes tragically simple, and in other cases exceedingly difficult. He pointed out that in Cardiff, during 1926, 527 fresh cases of tuberculosis had been notified and that the number of deaths from the disease was 288. These figures were relatively small, as during the year no serious influenza epidemic had occurred. After giving other interesting details as to the prevalence of the disease, and the housing conditions, together with the number of contacts, he proceeded to the detailed account of the early diagnosis of pulmonary tuberculosis, basing his description on Pottenger's classification of the symptoms into pulmonary, reflex, and catarrhal. He next emphasised the diversity of the modes of onset of pulmonary tuberculosis, and finally discussed the various methods of physical, laboratory, and radiographic examination. The tuberculin tests were not, he considered, of practical value to general practitioners.

Dr. J. R. GILLESPIE (Belfast) thought that the subcutaneous tuberculin test, but not Pirquet's skin reaction, was of great value in diagnosis. During the past 15 years he had found 300 cases giving negative results to the test, and of these only five subsequently developed tuberculosis. It should be remembered that a negative tuberculin test did not mean that the patient would be immune for life.

Dr. AMBROSE OWEN (Aberdare) agreed with Dr. Kennedy that tuberculosis was on the decline, but he thought that public health measures had done much to decrease the incidence of non-pulmonary tuberculosis. Epidemics of other diseases such as influenza were largely instrumental in increasing the incidence of pulmonary tuberculosis. Contrary to Dr. Kennedy's opinion, he found phthisis more acute than it was 15 years ago. Pleurisy and hæmoptysis were not always indicative of tuberculosis. Hæmoptysis especially was a frequent complication in epidemic influenza. A striking fact was that hæmoptysis occurred in phthisical and non-phthisical patients during the same seasons, and in the former was often due to secondary infections. Our failure to control the great epidemics affecting the respiratory system was one of the reasons why phthisis was still so rampant.

Dr. R. J. MATTHEWS (Newport) pointed out the contrast beyween tuberculin reactions in the urban and rural populations. The former gave positive and the latter negative reactions in most of the cases he had tested.

Dr. KENNEDY, in reply, said that we could only judge the results of treatment by statistics. Epidemics ceased owing to the attenuation of the germ and to the elimination of the susceptible people by death. By keeping alive those susceptible to tuberculosis, we were doing our own progeny a grave injustice.

EXHIBITION OF DRUGS, SURGICAL INSTRUMENTS, FOODS, AND APPLIANCES.

(Concluded from p. 302.)

SURGICAL AIDS; HOSPITAL AND LABORATORY EQUIPMENT.

[21] The Denver Chemical Manufacturing Co. and [25] The Thermogene Co., Ltd. (Haywards Heath, Sussex, and Victoria Embankment, E.C. 4), displayed their well-known "Antiphlogistine" and medicated wadding respectively for the few who are not already convinced of their value.—[53] Baird and Tatlock, London, Ltd. (14–15, Cross-street, Hatton-garden, E.C. 1), from a large selection of bacteriological, pathological, and physiological apparatus, selected for special attention an incubator with a patent registered regulator; Kahn's outfit for the precipitation test of leprosy and syphilis; and Horrock's outfit for detecting chemical poisons in water.—[79] British Distribution Co. (52, Mortimer-street, W. 1) demonstrated the "Camp" physiological supports, embodying certain patent adjustments designed to give correct anatomical support without undue constriction and with the required pressure and uplift. Special models shown were the "Camp" ptosis support for gastric or intestinal prolapse; "Camp" visceroptosis support, giving a flattening yet upward-cupping effect, and "Camp" post-operative supports.—[29] R. H. Dent (309, Oxford-street, W. 1) had devised several new features of the "Ardente Aid for the Deaf." The wrist-watch pattern, shown last year, has been followed by the "hat-button," which can be pinned inside the lining of a hat and is remarkably inconspicuous. The latest stethoscope is smaller than its predecessors, can be used monaurally or binaurally, and gives a very clear enhanced sound with complete absence of electrical noises.—[35] Fassett and Johnson, Ltd. (86, Clerkenwell-road, E.C. 1), were showing again the well-known Mead's rubber adhesive plaster, and Seabury's "Gold Cross" absorbent cotton, as well as plasters, ligatures, and bandages.—[85] General Acoustics, Ltd. (77, Wigmore-street, W. 1), drew special attention this year to the new "Dime" earpiece, about the size of a sixpence and weighing two ounces, worn without head-band or crook, and leaving the hands free. The midget battery is very powerful and gives no distortion.—[15] Theodore Hamblin, Ltd. (15, Wigmore-street, W.1), showed ophthalmic instruments and equipment, including the Lister-Morton luminous ophthalmoscope; a new children's astigmatic test by Mr. E. E. Maddox; the Lawson self-contained operating lamp for use where no electric current is available; and a special display of telescopic spectacles for operating and for low visual acuity.—[13] Charles Hearson and Co., Ltd. (68, Willow-walk, S.E. 1), showed a wide range of incubators, ovens, stills, centrifuges, and other laboratory equipment, including the "Hellige" comparator for estimating pH values; a new "Klett" top-reader colorimeter, and several new Reichert microscopes, especially a monobinocular one on a new principle. This firm has opened a new show-room at 27, Mortimer-street, W. 1.—[40] Hoskins and Sewell, Ltd. (Bordersley, Birmingham), emphasised the usefulness of the new patent castor-pad action for allowing the bedstead to stand firm on rubber pads or to be wheeled on castors. They also showed the Nottingham Children's Hospital wheeling cot; the S. P. Smith's extension fittings with side attachment for abductions, by which any and all fractured limbs can be fixed; and several other bed attachments and screens.—At Stand [56], The Inhaling Drug and Apparatus Co., Ltd. (30, Grosvenor-place, S.W. 1), we learned that even insulin may now be administered by inhalation therapy, while excellent reports have been received of the use of the Spiess-Drager drug nebulising and inhaling apparatus in the treatment of tuberculosis and whooping-cough, as well as asthma and other lung conditions.—[64] Short and Mason, Ltd. (Atlantic House, 45–50, Holborn-viaduct, E.C. 1), demonstrated

measurable by weighing, and was stronger than old tuberculin. He had no reason to believe that it would have any greater therapeutic value than tuberculins in general.

In the afternoon Mr. MORRISTON DAVIES and Mr. TUDOR EDWARDS gave a demonstration of the results of thoracic surgery, and later, at the Cardiff Royal Infirmary, showed a series of patients on whom thoracoplasty had been performed. Dr. PARRY MORGAN (Cardiff) showed his artificial pneumothorax apparatus fitted with a double manometer.

AFTER-EFFECTS OF SURGICAL PROCEDURES IN PULMONARY TUBERCULOSIS.

Mr. TUDOR EDWARDS (London) opened the discussion by reading a paper on the after-effects of surgical procedures in cases of pulmonary tuberculosis. He regarded the after-results as being due to a series of factors such as: (1) the right choice of cases, (2) the type and extent of the operation, (3) the anæsthetic employed, (4) the operative mortality and complications, and (5) the after-treatment. In discussing the choice of cases for operation, he said that the chief factor was the condition of the "better" lung, which should show no active disease for at least three months prior to the operation. In cases of doubt it was his custom to perform a preliminary phrenic evulsion on the more-affected side in order to test the capacity of the better lung to withstand the increased strain to be placed on it. In his experience there was a tendency to wait too long before the surgeon was called in. The chances of recovery by surgical measures diminished with the increase of the amount and activity of the disease in the lung. Surgical procedures in diseases of the chest had incurred a certain amount of unnecessary odium mainly on that account. Experience had convinced him that adequate collapse of the affected lung could be obtained by a preliminary phrenic evulsion and a subsequent two-stage thoracoplasty from the first to the tenth ribs posteriorly. In order to produce localised collapse, phrenic evulsion and pneumolysis were satisfactory operations. In tuberculosis, however, it was usually necessary to secure complete collapse. The best anæsthetic was a gas and oxygen combined with local anæsthesia. The operative mortality and the complications of thoracoplasty such as shock, pulmonary embolism, spread of disease in the opposite lung, and septic infection of the wound could be largely diminished by careful pre-operative and after-treatment. No complications had occurred in his cases of phrenic evulsion and apicolysis, nor had they required much in the way of after-treatment. In thoracoplasty, after-treatment is essential, an important feature being that the patient should spend from three to six months under sanatorium régime.

Dr. F. G. CHANDLER (London), in discussing the question from the physician's point of view, said that a physician, in recommending a serious operation, took a great vicarious burden on himself. He should ask himself the question, "Would I, if necessary, have this operation performed on a member of my family or on myself?" The surgeon's relationship to the patient was, in a sense, impersonal, and it was the physician who had to consider the operative risk, the possibility of after-pain and discomfort, and the ultimate result. In chest surgery there were peculiar difficulties. Problems of judgment arose as well as questions of technical skill. If it were possible, a combination of the physician-surgeon would be ideal, and there were indications that developments along these lines were taking place. The open operation for dividing pleural adhesions was, in his experience, usually followed by sepsis and empyema, although there was little disturbance from the actual operation. In phrenic evulsion the immediate risk was small, but some complications, such as hæmorrhage, hæmoptysis, air embolism, chylous fistula, pulmonary œdema, and injury to other nerves had been reported. He agreed with Morriston Davies that the operation was of undoubted value in basal tuberculosis and as an accessory operation in artificial pneumothorax. Apicolysis and pneumolysis were, from the physician's point of view, the operations of choice. The shock, after-discomfort, and operation mortality were negligible. A satisfactory packing substance had still to be found, but he was greatly interested in the possibilities of these operations. It was difficult to judge the merits of thoracoplasty, on account of the extremely variable results. The after-results could not be usefully discussed without a clear idea of the criteria of suitability and non-suitability. Of the cases suitable for the operation, he gave the following types: (1) If a successful artificial pneumothroax had been allowed to terminate with a recurrence of symptoms and re-collapse was not possible; (2) if an artificial pneumothorax was imperatively indicated in a case of progressive unilateral disease, yet by reason of adhesions, it was not possible to induce one; (3) if chronic unilateral disease was present causing distressing symptoms. The cases not suitable included: (*a*) those in which there was a suspicion of active or progressive disease in the "better" lung; (*b*) those in which the general resistance was poor; (*c*) those with fibroid phthisis with every prospect of a reasonably healthy life; and (*d*) cases with amyloid disease or tuberculous ulceration of the intestines. The operative mortality varied between 5 and 12 per cent., the after-pain and distress were frequently considerable, but the results of the operation were, on the whole, good. Surprisingly little deformity was produced. The result could not be guaranteed, but in some cases there was a prospect of complete and permanent recovery which no other method of treatment could procure. Oleothorax, although our experience of it was limited, would probably be of great value in preventing obliterative pleurisy in artificial pneumothorax.

Dr. D. W. FENWICK JONES gave the results of 24 cases of thoracoplasty carried out at the North Wales Sanatorium. His general impression was, that while it was a desperate operation in advanced cases, it was a pity that cases of earlier disease were not selected for the treatment.—Dr. WALL said that the last stronghold of the physician had been taken by the surgeon, but he agreed that the results of chest surgery were good, and he looked forward to the establishment of the chest specialist who would be both a physician and a surgeon.—Dr. D. A. POWELL (Cardiff) remarked that we were at the beginning of an important operative era, in which specialism would be regional, and not divided into medicine and surgery. He was somewhat disappointed with the results of artificial pneumothorax, and hoped that those of thoracoplasty would be better.—Mr. MORRISTON DAVIES, in showing a series of photographs and radiograms of cases of thoracoplasty, pointed out in the photographs the negligible deformity as compared with radiograms of the same cases showing extensive collapse of the lung and the chest-wall. He regarded the one-stage operation as better than the two-stage, because the pulmonary collapse obtained was more complete, and also because the patient did not have to face the anxiety and shock of two serious operations. He pleaded for the establishment of operating theatres in sanatoria, and thought that in this respect the example of the Welsh Memorial Association might well be followed.

Mr. EDWARDS, in reply, said that after-pain was largely due to bad technique. An operative mortality of 12 per cent., taking everything into account, was not excessive.

TUBERCULOSIS AS SEEN BY THE GENERAL PRACTITIONER.

Dr. ANGUS KENNEDY (London), in opening the discussion, said there had been a surfeit of laudation about the success of the campaign against tuberculosis. In his opinion, the expenditure of time and money had not been justified. The mortality from tuberculosis in 1821 was 25 per cent., in 1871, 12 per cent. So that, at a time when no preventive measures had been taken, the mortality had fallen to half. Since then, with the advent of the campaign, the mortality had fallen only 3 per cent. He explained this as being due to the fact that tuberculosis was an epidemic disease and that, as in all epidemics, the virulence of the bacillus had been greatly attenuated until the disease was now very mild, and in fact endemic. In 50 years' time it might again become epidemic. Immunity in his opinion was inherited, and by way of illustration he cited his experience among negroes who had come to the East-end of London. In one half-caste family he had observed that the boys, who all had a touch of the "tar-brush," died from tuberculosis, whereas the girls, who had inherited mostly the characteristics of the white parent, were still alive. We should aim at producing a race immune from tuberculosis. Before people marry they should look into the family history as well as into the banking account.

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the familiar "Tycos" sphygmomanometers, thermometers, and barometers. The new automatic recording type will be on the market shortly.—[92] Simco, Ltd. (22–28, Shand-street, S.E. 1), showed a range of beds which contain no cast iron, and are, therefore, unbreakable, especially an adjustable fabric-bottomed bed in which the patient can be put into any position with a minimum of effort. The universal bottom can be fitted on any ordinary bed frame, and is, therefore, extremely convenient for home nursing.—[4] Spencer Corsets, Ltd. (Banbury, Oxon), stressed the fact that each garment made by them is designed for each individual patient from exact measurements by a trained corsetière. They drew particular attention to their sacro-iliac corset and abdominal supporting corset for visceroptosis and pregnancy.—[48] John Weiss and Son, Ltd. (287, Oxford-street, W. 1), had a display of surgical instruments, including many new models and modifications, and a great number in stainless steel. The display included thyroid and cystoscopic instruments, and Bishop Harman's scotograph.—[90] Whitfield's Bedsteads, Ltd. (109–125, Watery-lane, Bordersley, Birmingham), showed improved "Lawson Tait" fracture, epileptic, cardiac, and obstetric bedsteads, drawing attention to the fact that the double wheeling foot-end can be let down on to wood blocks when the bed is wanted steady. The obstetric pattern has nickel-plated crutches and a winding-up frame.

X RAY, LIGHT, AND HEAT APPARATUS.

[78] The Dowsing Radiant Heat Co., Ltd. (91–93, Baker-street, W. 1), showed samples of many modern appliances for the application of the Dowsing treatment, ultra-violet lamps, and electric radiators of all kinds, particularly an expanding radiant heat apparatus which can be used for both legs or the abdomen or a single limb.—[91] Philips Lamps, Ltd. (145, Charing Cross-road, W.C. 2), introduced the "Metalix-Portable," a new compact apparatus for the general practitioner, which packs into a suit-case, stands on adjustable telescopic legs, plugs into any wall fixture, and is absolutely shock-proof. There was also a new deep therapy tube for operation at 220,000 volts.—[77] The Solus Electrical Co. (100, Judd-street, W.C. 1) showed a 30-M.A. X ray transformer set, complete with all-metal control table; the Solus-Jarhns Potter-Bucky motor-driven revolving grid, with special centring device; the valve-rectified "Solustat" apparatus; an air-cooled double-gap diathermy apparatus, and a great range of electro-medical and ultra-violet apparatus.

BOOKS.

[5] Messrs. Baillière, Tindall and Cox (8, Henrietta-street, W.C. 2) exhibited English and American medical and scientific books from their own press, as well as those issued by a number of other firms.—[68] Messrs. J. and A. Churchill (40, Gloucester-place, W. 1) showed an interesting series of medical directories, from the small crown octavo of an inch thick, of 1846, up to the enormous eighty-fourth issue of last year. Among other books were Massie's "Surgical Anatomy"; the seventh edition of Rowlands and Turner's "Operations of Surgery"; the new Taylor's "Medical Jurisprudence"; the ninth edition of Cushny's "Pharmacology"; and the "Recent Advances" series, of which the latest are: "Diseases of Children," by W. J. Pearson and W. G. Wyllie; "Surgery," by W. Heneage Ogilvie; and "Tropical Medicine," by Sir Leonard Rogers—[72] William Heinemann, Ltd. (99, Great Russell-street, W.C. 1), included in their exhibit MacCormac's new edition of Jacobi's "Atlas of Dermochromes"; the second edition of Dan McKenzie's "Diseases of the Throat, Nose and Ear"; McDonagh's "Nature of Disease"; and Halls-Dally's "Low Blood Pressure."—[37] H. K. Lewis and Co., Ltd. (136 and 140, Gower-street, W. 1), had a number of convenient clerical aids for the practitioner, including a new roll-top cabinet for panel envelopes in one. two, three, or four sections, each holding 500; and a useful series of instruction slips for patients, giving printed details, for instance, of how to prepare a fomentation, exercises for constipation, after-care of dental extractions, and alkaline treatment of gastric ulcer. On the covers supplied for these slips are relevant reminders for the doctor. Among the books recently issued by this firm are "The Injection Treatment of Varicose Veins," by A. H. Douthwaite, third edition; "A Shorter Anatomy" and "Anatomy for Artists," by E. Wolff; and "The Brain from Ape to Man," by Dr. Tilney.—[89] The Oxford University Press (Falcon-square, E.C. 1) showed text-books, manuals, and other works, including "Gastro-Intestinal Diseases," from the James Mackenzie Institute; the Robert Jones birthday volume; the fourth edition of Humphris' "Artificial Sunlight"; and the second enlarged edition of Fairbairn's "Gynæcology with Obstetrics."—[16] John Wright and Sons, Ltd. (Bristol), showed a large selection of books, including a new edition of Herbert French's "Index of Differential Diagnosis of Main Symptoms"; H. L. Tidy's "Index of Symptomatology"; C. P. Wakeley's and St. J. D. Buxton's "Surgical Pathology"; and the "Synopsis" series.

SPAS.

[94] Braceborough Spa (Lincs.) is already known as valuable for skin affections, and its water is now being prescribed for the treatment of latent infections. The calcium content is very high: 30·39 grs. per gallon of calcium bicarbonate, and is, therefore, recommended for all forms of calcium deficiency, particularly in infants.—[18] Harrogate (Baths and Wells Department) has added to its already diverse waters "Fango," a curative mud which has recently been discovered near the axis of the anticline around which the peculiar geological formation of the Harrogate strata centres. The mud is radioactive, and contains sulphur.—[3] The Stanboroughs is the London hydropathic establishment, and has excellent facilities for convalescent care and modern methods of treatment.

MISCELLANEOUS.

[74] The Food Education Society (29, Gordon-square, W.C. 1) displayed its dietetic books and pamphlets, including a number of Welsh editions. The latest leaflet, entitled "A Salad a Day," gives arguments and prescriptions for salads. Mr. Hecht's "School and University Diet" and "The Diet of Brain Workers" were selling well, and another useful publication on show was "The Reform of Institutional Housekeeping."—[86] The Hammond Varityper Co., Ltd. (75, Queen Victoria-street, E.C. 4), naturally laid emphasis on the special medical keyboards for typing prescriptions, and also the mathematical and chemical formulæ keyboards and those especially adapted for writing in foreign languages.—[36] The Medical Insurance Agency (B.M.A. House, W.C. 1) again recommended its valuable services, particularly drawing attention to the charitable work it is able to support both at Epsom College and for the orphan daughters of medical men. Messrs. Mann, Egerton and Co., Ltd., continue to act as consulting motor engineers to the agency.—[55] The Medical Sickness Annuity and Life Assurance Society, Ltd. (300, High Holborn, W.C. 1), offered its usual attractive policies to doctors and dentists.—[88] An unusual but very interesting exhibit was that of the Pentecon High-pressure Casserole Cooker, shown by Phillips and Proctor, Ltd. (125, High Holborn, W.C.1). In this simple covered saucepan food is cooked under a pressure of 45 pounds to the square inch. In this way the heat is greatly intensified, and any food can be cooked in eight minutes. It is almost impossible to overcook, and therefore a joint and vegetables can be put in together, the pressure adjusted by a simple device on the cover, and when the whistle blows a few minutes later all the contents will be found equally cooked. In addition to the obvious domestic advantage in saving time, worry, and fuel, there is a dietetic advantage in that the starch-cells are merely swollen and not burst by this cooking and the "goodness" is therefore conserved. The taste is certainly

excellent.—[66] Radiation, Ltd. (15, Grosvenor-place, S.W. 1), showed an exhibit of gas-heated appliances for dentists, and described by means of diagrams a series of experiments undertaken in an attempt to improve the quality of the heat emitted by gas-grates and cookers by obtaining a softer and more penetrating wave-length.—[75] The "Vita" Glass Marketing Board (Aldwych House, W.C. 2) attended for the first time to explain the properties and methods of fitting "Vita" glass which, while transmitting a large proportion of the ultra-violet spectrum, is indistinguishable from it in appearance, can be obtained from local builders, and is entirely British.

Special Articles.

CONGRESS OF RADIOLOGY.

STOCKHOLM: JULY 23RD–27TH, 1928.

THE Second International Congress of Radiology which met in Stockholm from July 23rd to 27th, under the presidency of Prof. GOSTA FORSSELL (Stockholm), was attended by 962 members from 40 countries. T.R.H. the Crown Prince and Prince Charles of Sweden were present at the inaugural meeting in the Concert House, when Prof. Forssell received the presidential badge, a gift from the British Institute of Radiology, at the hands of Mr. C. Thurstan Holland and Dr. Stanley Melville, respectively president and secretary-general of the First International Congress held in London in 1925. The President then opened a discussion on Teaching and Training in Medical Radiology, expressing his own conviction that radiology has become so important to medical science as a whole, and so firmly established as a department of that science, as to make a systematic presentation of the subject an essential part of the general medical education. He was followed by Dr. J. BELOT, speaking for France, Prof. M. HICKEY, for U.S.A., Dr. G. HOLZKNECHT, for Austria, Dr. MELVILLE, for Great Britain, and others, all whose papers will be published in book form as a supplement to *Acta Radiologica*. The sectional proceedings of the Congress took place in the Riksdagshuset, being divided into (1) Rontgen Diagnostics, (2) Rontgen and Radium Therapy, (3) Radiobiology and Heliotherapy, and (4) Radiophysics and Medical Radiology. Altogether 225 papers were read, one of which we published in our issue of August 4th (p. 221); abstracts of several others follow. In the first section a number of papers dealt with opaque injections into brain and spinal column for the diagnosis of tumours and other diseased conditions of the central nervous system (encephalography and myelography), into female genital organs (hysterosalpingography), into kidneys (pyelography and pneumopyelography), as well as the use of contrast means in the examination of the accessory sinuses of the nose. In the second section the chief interest centred around the radium treatment of malignant tumours and the X ray treatment of nervous disease of different kinds—tuberculosis, goitre, and diseases of the skin. The organisation and the results obtained at Radiumhemmet in Stockholm were illustrated by a demonstration of some 100 patients. In the third section papers were read on the effect of light in various diseases, the action of ultra-violet rays on cells and tissues, and the therapeutic value of irradiated oils. The fourth section had two main themes on its programme: (1) the establishment of an international unit of dosage in X ray treatment, to which a leading article was devoted in our columns last week; and (2) the question how to obtain international regulations for protection in radiological work. The latter led to the setting up of an international committee to carry out with a few small alterations the recommendations of the British X ray and Radium Protection Committee. During the Congress the International Committee of Radiology met and appointed an executive committee consisting of Prof. Forssell, Mr. Thurstan Holland, Dr. A. Béclère, Prof. W. Friedrich, Prof. M. Haudek, Dr. G. A. Pfahler, and Prof. P. Tandoja, which fixed Paris as the place for the Third International Congress in 1931, with Dr. Béclère as its president. An exhibition in connexion with the Congress comprised apparatus shown by 45 firms, of which 24 were from Germany, 7 from England, and 5 from Sweden.

Rationale of Radiation Therapy.

Invited to contribute a paper on this subject Dr. ROBERT KNOX (London) dealt with the radiation treatment of certain diseases, arranged for convenience of reference in groups. In the cases treated, at one period or another, a degree of control was obtained by systematic dosage; to ascertain the nature of this control innumerable observations were made in regard to dosage, absorption of the radiations, and the nature of the response of the tissues to these radiations. Two main fields of investigation were open: (1) the physical dose, and (2) the tissue response. It was decided to concentrate on one tissue and, because of the advantages offered by the blood, it was arranged, as a preliminary investigation, to explore the changes induced in blood and bone marrow by X rays of known wave-length. Mr. W. V. Mayneord made the precise physical measurements of the radiation. The tissue response was measured by Dr. A. Piney, who observed the hæmatological and histological changes in a number of animals subjected to measured doses of X rays. The direction of the experimental work was suggested by the clinical observations made in a case of myelogenous leukæmia where apparently a progressive action on the blood was induced by measured doses of radiations, and where after cessation of treatment, changes, quantitative and qualitative, continued for several months until a minimum count was reached. The animal experiments establish that radiations initiate a change which is progressive, and which continues after the cessation of treatment, and independently of subsequent procedures. The conclusions are to some extent analogous to those made by Dr. A. Leitch on the production of cancer in animals by repeated applications of tar products; when the tar had been applied frequently and for a certain length of time and the irritant was then removed, carcinomata made their appearance at a later date. Dr. Piney found the effects of divided doses to be more intense and more prolonged than those of a single dose, whilst also having a rather different qualitative result—namely, the former cause no alteration in the monocyte count.

Massive Collapse of the Lung.

Dr. L. R. SANTE (St. Louis, Mo.) and Dr. D. R. BOWEN (Philadelphia) both read papers on this peculiar condition in which one or more lobes of the lung, without apparent cause, suddenly lose their air content and become atelectatic. First described by W. Pasteur in 1890, the condition is scantily mentioned in the literature until recent years. With the loss of air content the lung becomes smaller, drawing the chest wall down with it, the mediastinal structures inward and the diaphragm upward as it collapses. The resulting atelectatic lung produces as dense a consolidation as pneumonia. These rontgenographic findings are characteristic. Dr. Sante has observed under direct fluoroscopic vision that such a fully collapsed lung can be caused to reinflate in many instances, merely by rolling the patient back and forth on his unaffected side and causing him to cough, and he suggests this as a method of treatment. Dr. Bowen emphasised the recent rediscovery of atelectasis as a post-operative complication with precisely similar conditions to those recurring with foreign body or infectious disease.

Radium Treatment of Intrinsic Carcinoma of the Larynx.

Dr. N. S. FINZI and Mr. DOUGLAS HARMER (London) described their method as closely resembling that employed at Bayet's Clinic. The incision starts at the centre of the hyoid bone and extends outwards and downwards along the posterior border of the thyroid cartilage. The thyroid cartilage is exposed, the perichondrium stripped from it and the greater portion of the cartilage then resected, making a large window. A number of radium needles are then inserted under the cartilage, great care being taken not to penetrate into the growth or into the larynx. The needles are parallel and are placed vertically, each one touching the next. The greatest care is taken to prevent sepsis. The threads attached to the needles are buried beneath the muscles and the wound is completely closed until the needles are removed from 4½ to 8 days later. If the anterior commissure is involved the other side of the larynx is treated in the same way. About 7 mg. of radium element is used if one side only is treated and about 12 mg. if both sides are treated. The filter is 0·5 mm. of platinum and the time from 4½ to 8 days. In some cases a small dose of heavily filtered X rays has been given *two or three* days before the operation. The closed wound having been sealed by a collodion dressing, a low tracheotomy is performed to avoid trouble from swelling of *the glottis, which may result from the radium treatment*; this tracheotomy is usually kept open for about six weeks. Fifteen cases have been treated with the following result:—

(1) In eight of these the growth was confined to one vocal cord and did not involve either the anterior commissure or the arytenoid cartilage. In six the growths entirely disappeared and the patients have remained well for periods of from one to three years. Gramophone records will be used to show the superiority of the results as regards function over those obtained by laryngo-fissure. In most of them the vocal cords have recovered to such an extent that it is impossible to detect on which side the growths were situated. In one case the growth diminished in size, but a stenosis of the glottis resulted and the patient died suddenly eight months later of unknown cause. In the eighth case no real improvement resulted from the treatment.

(2) Five cases were advanced, the disease having crossed the middle line in front and involved the other vocal cord, so that nothing except some form of laryngectomy was available as a surgical procedure. One has remained well *for four years; his vocal cords are freely movable and* appear normal, but the voice result is not as good as would be expected (gramophone record). In one case the disease in the larynx entirely disappeared, but the patient died later from a recurrence, which occurred in the tracheotomy wound a year after the treatment. Of the other three cases, one died during the operation, in one no improvement was noticed, and in one there was improvement, but later recurrence.

(3) Two inoperable cases in which the disease had extended into the larynx or through the laryngeal cartilages into the neck with enlargement of the cervical glands. In one the growth disappeared and the glands were removed by operation; the larynx remained healthy for two and a half years, but there is now a thickening of the vocal cord, probably due to a recurrence. In the other there was very great improvement, but the patient died after 15 months, probably from mediastinal metastases.

It is claimed that in operable cases the after-results as regards function are superior to surgical operation, and, if they prove to be permanent, will probably replace it. In advanced cases there seems no doubt, they say, that radium should always be tried before laryngectomy.

X Ray Therapy of Exophthalmic Goitre.

Dr. G. FORSSELL and Dr. O. SANDSTRÖM (Stockholm) gave a survey of experiences at Radiumhemmet of the X ray treatment during the period 1918–25 of 80 cases of typical morbus basedowii. In 57 cases the treatment was completed and the results controlled by re-examination of the patients. Of these 57 cases 30 (52·6 per cent.) are now quite well and able to work; 13 (22·8 per cent.) are much improved and able to work, but still have certain symptoms; 75·4 per cent., therefore, have been rendered able to work; 5 cases (8·8 per cent.) are improved, but not quite able to work, and as many (5) are unimproved or worse; there are 3 (5·3 per cent.) recurrences after recovery or considerable improvement having lasted for some time; there has been one death. Approximately one-fourth of the number of cases have been of severe nature, the rest of medium severity. The risk of rontgen treatment in expert hands is slight. Yet there is a certain risk of producing hypothyroidism, particularly in case of the nutrition of the thyroid being reduced by some operative interference preceding or following the X ray treatment.

Dr. A. SOILAND, Dr. W. E. COSTOLOW, and Dr. O. N. MELAND (Los Angeles) gave a critical survey of radiation therapy in exophthalmic goitre, as revealed by a questionnaire, and show that of 5400 cases treated *73 per cent. were cured, 16 per cent.* improved, and 11 per cent. unimproved. Failures to respond to the treatment are attributed to poor selection of cases on the part of the physician, lack of coöperation on the part of the patient, and lack of radio-sensitivity of the goitre. Whether or not this last cause is correct cannot be definitely decided at present, as improvement in technique may eliminate it. This analysis gives figures which are comparable to those obtained in surgery, with the added advantage of no mortality due to the treatment itself.

X Ray Treatment of Multiple Sclerosis.

Stimulated by the published successes of Marinesco (1910) and Duhain (1911), Dr. A. Romanowa-Leskowa and Dr. K. W. Ipatow (Leningrad) began the treatment of *sclérose en plaques* by X rays in 1922, and reported good results in two cases at the Psycho-Neurological Society of Leningrad in 1924, and in a total of 30 cases at the Physiotherapeutic Society of Leningrad in 1927. Their cases now number 40, of which only 28 have been observed for more than a year; the remaining 12 were lost sight of after some improvement had been achieved. Treatment is administered in seven sittings; at intervals of 1–2 days the skull is irradiated three times, the neck once, the chest twice, and the sacrum once. This series is given ten times in the year, the whole course being repeated after an interval of 6 to 12 months. Of the 28 patients, 22 showed more or less definite improvement up to clinical cure, including improvement of *gait and speech, disappearance* of tremor, return of abdominal reflexes, and so forth. No case was completely unsuccessful, but six were only slightly bettered. Improvement may only be apparent after several months or even years. The authors employed hard rays filtered through 4 mm. of aluminium, and a dose not exceeding 25 per cent. HED measured on the skin.

New Method of Treating Asthma by Radiation.

While working on a special technique for treating cancer by radiation at the London Hospital, Dr. S. G. SCOTT noticed that the method had a *beneficial* effect on asthmatical patients. A number of cases of asthma of all types have now been treated; in really bad cases the results are often spectacular. When bronchitis is predominant, while the attacks of *asthma* may be relieved, the bronchitis itself is but little affected. Certain observations suggest some metabolic influence on the ductless glands—e.g., (1) beneficial results can be obtained by radiation of *the abdomen* only; (2) increase in body weight is in many cases remarkable; (3) there is a general feeling of well-being experienced by most patients. The method requires a large radiation field and small dosage. The field includes the whole trunk, the abdomen being the important area. The tubes are centred over the epigastrium and over a corresponding point posteriorly. The voltage should not be above *170,000*, a filter of 3 mm. aluminium being used. Treatment is given twice weekly in bad cases and once weekly in average cases, four to six being the course. No blood changes occur and only slight nausea in a *few* patients. Dr. Scott reported on 130 cases so treated, and suggested that the same technique might prove of value is whooping-cough.

Treatment by Irradiated Oils.

At the instigation of Prof. S. A. Brustein, Dr. Th. Rothstein (Leningrad) began three years ago to employ external treatment of painful affections by means of compresses of irradiated oil. The technique consists in exposing the fresh oil, whether obtained from the sunflower, peach, nut, or cod liver, to 500, 1000, or 1500 ultra-violet units measured on the Salkindson photo-quantimeter. The 176 cases treated included polyarthritis 71, neuralgia 92, the most conspicuous result being in every case a reduction of painfulness and a parallel diminution of local heat. The compresses seem to the author to have their use in every case where direct ultra-violet treatment is used, with the added advantage of portability. The activity of the irradiated oils lasts at least 15 months, during which time the oils retain definite physical and chemical changes in viscosity, absorption spectrum, and iodine number.

MEDICINE AND THE LAW.

Chemist's Duty under Dangerous Drugs Legislation: Conviction Quashed.

UNDER the Dangerous Drugs Act and Regulations a chemist must not dispense a prescription containing certain drugs unless (*a*) he is acquainted with the prescriber's signature and has no reason to doubt the genuineness of the prescription, or (*b*) he has taken reasonably sufficient steps to satisfy himself that the prescription is genuine. If he dispenses prescriptions otherwise than in accordance with the Regulations, he commits an offence against the Act. For an offence of this nature Henry Clarence Thompson, a chemist, of West Derby-road, Liverpool, was convicted last June by the Liverpool Stipendiary Magistrate, and was fined £40 with £5 5s. costs. The charge was that of unlawfully dispensing a prescription for grs. 20 morphia sulphate to William Arthur Young without having taken reasonably sufficient steps to satisfy himself that the prescription was genuine. Against this conviction Mr. Thompson has now successfully appealed. It appeared from statements made during the proceedings that Young had posed as a doctor in Liverpool without possessing the requisite qualifications, that he had attended patients and had even certified a mental case. Young was convicted of wilfully and falsely pretending to be a doctor and also of obtaining certain quantities of morphia sulphate from two chemists; he was sentenced to imprisonment, which he is at present serving. It was stated that he had practised as a doctor in Canada but had got into trouble, and lost his qualifications and had been deported. The prosecution of Mr. Thompson was obviously a sequel to the prosecution of Young. The most important evidence called on Mr. Thompson's behalf was that of Dr. W. R. L. Waters, of Tue Brook, who had met Young. Young told Dr. Waters that he was a Canadian mental specialist who wished to set up practice in Liverpool. "I did not look him up in the Register," said Dr. Waters; "he was a convincing person and had a good knowledge of mental cases; he impressed me as a man of ability, and I was satisfied that he was a medical man; I allowed him to see one of my patients with me, and he wrote out a detailed history of the case—a mental one." In answer to the Recorder (Mr. Hemmerde, K.C.), Dr. Waters agreed that the more a chemist had examined Young, the more he would have been satisfied that Young was a doctor; he also said that he would not have hesitated to let Young look after his patients at a week-end if he had been going away. The Recorder said that if there was nothing to make Dr. Waters suspicious, there was nothing to make Mr. Thompson suspicious. The latter's appeal was allowed with costs.

One medical practitioner meeting another occasionally in the course of professional routine does not hold him at arm's length till he has obtained authentic evidence of his identity, qualifications, and registration. Similarly a chemist, who gradually becomes acquainted with the signatures of doctors who practise in his neighbourhood, can hardly be expected to go through a similar process when presented with a prescription over a signature with which he is unfamiliar. Is it to be deemed compulsory for a chemist to keep on his premises a copy of the latest medical list? If he does so, he may still be deceived by a forged signature, or conceivably the owner of the signature may have been deprived of his qualifications since the list was published. Nevertheless, the law requires that such reasonably sufficient steps be taken by the chemist as will satisfy him of the genuineness of the prescription; he must certainly not refrain from following up any point which arouses his suspicion. With regard to Dr. Waters's answers to the Recorder, it is doubtless unnecessary to repeat the warnings which appear in "The Conduct of Medical Practice." A practitioner who enters into partnership, or who engages the services of an assistant, must in every case verify the fact of registration. Dr. Waters would no doubt have taken this step before entrusting any of his patients, for however short a time, to Young.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Medical Research.

Sir Robert Philip's report, as curator of the laboratory of the Royal College of Physicians of Edinburgh, shows that the 24 investigators there have been doing good work on many different subjects. The use of taurine in tuberculosis has been further studied, and its influence on the disease has been found to be comparatively slight. The curator, with Prof. T. J. Mackie, has been doing research bearing on the standardisation of tuberculin; the superintendent (Lieut.-Colonel A. G. McKendrick) and Dr. W. O. Kermack have been carrying on their work on the mathematical theory of contagious epidemics, and Colonel McKendrick has also published a statistical examination of antirabic treatment in India. He has further collaborated with Dr. Kermack and Dr. Eric Ponder in their research on the sedimentation of red blood cells, whilst Dr. Kermack has, with various collaborators, investigated the chemistry of harmine and other alkaloids, the rôle of dihydroxyacetone in carbohydrate metabolism, and the physical properties of Wassermann antigens. Mr. C. I. B. Voge has continued his studies of the reactions of syphilitic and normal sera; Dr. C. G. Lambie and Dr. F. A. Redhead have made some interesting observations on the influence of pituitrin on the metabolism of glucose and dihydroxyacetone; Dr. David Orr has investigated the changes to be found in the nervous system of animals receiving intravenous injections of bacterial emulsions, and Dr. Donald Stewart has carried to a further stage his work on the chemistry and cytology of the cerebro-spinal fluid in children. Lieut.-Colonel W. F. Harvey, a newcomer to the laboratory, is examining Gram's method of staining unicellular organisms, and has found efficient substitutes for the alcohol, aniline oil or phenol constituents of the dye. He is also studying the parenteral introduction of foreign nerve material into rats. Other subjects being dealt with are the conditions which favour heat-stroke, the infection of children by pulmonary diseases, the pathology of deaf mutism, the histopathology of the skin, the types of tubercle bacilli found in surgical lesions, and the icterus index of serum in cases of jaundice.

Status of the Sanitary Inspector.

At the annual conference of the Sanitary Inspectors Association, held at Dunfermline, Dr. Frederick Dittmar, Chief Medical Officer of the Scottish Board of Health, pointed out that the days were gone when it was believed that a policeman or a plumber should occupy the position of sanitary inspector. Generally speaking, the sanitary inspector nowadays had to know something about buildings, building construction, meat inspection, and dairy work, so that he must be a man of fairly wide training. He should have a first-class school training, and ideally should occupy some position similar to that of the articled pupil in the engineering trade, who first had his theoretical training, and then had to go through the shops. Something in that line would have to be marked out for the sanitary inspector of the future, and Dr. Dittmar thought it by no means impracticable. The status of the sanitary inspector might then take care of itself.

Factory Work and Welfare.

The report of the Chief Inspector of Factories and Workshops shows that there were over 18,000 accidents in Scotland last year, of which 145 were fatal. The deaths of two men who had for many years been employed in the manufacture of sheep dip present puzzling features.

> The first man, who had been engaged in the manufacture of dip for over 30 years, died from chronic arsenical poisoning, bronchitis, and emphysema. The senior medical inspector (Dr. J. C. Bridge) remarks that in this case no lesion of the skin—a characteristic effect of arsenical poisoning—was observed, and as no autopsy was held, the association of arsenic with the cause of death remained obscure.
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> Inquiry was made into a somewhat similar case affecting a man, aged 51, who had been employed for 29 years also in a sheep dip works, although since 1923 he had been removed from contact with arsenic. Dr. Bridge states that "on three separate occasions growths had been removed from the skin, and in this case the post-mortem examination revealed the presence of chronic bronchitis, which might have been due to the exposure to arsenic dust, but this was not clearly established. A full investigation of cases such as these is of undoubted value."

A firm engaged in the manufacture of sheep dip has installed baths, and has made the taking of them a condition of employment of all those in contact with arsenical compound. Although there was, it is stated, a little difficulty at the outset, this was easily overcome, and subsequently these baths were made available for other employees, male and female.

Continued progress in improvement of welfare conditions is reported. A large printing and publishing firm in Lanarkshire has taken advantage of the decision to construct an up-to-date factory on model lines to launch an ambitious and comprehensive scheme of welfare work. Embodied in the design of the factory itself is every modern improvement that makes for efficiency and general welfare. The site has been chosen in the country, but by reason of excellent and cheap travelling facilities, the city centre is not far distant. The kitchen is entirely electrical, and meals are to be provided for the workers at prices scarcely above cost, whilst, for those who prefer to bring their own food, specially designed warming cabinets are provided. The lavatories are described by the works manager as probably superior to those in the best hotels of the country, and a separate self-locking lavatory has been allotted to each group of 20 workers, every worker being provided with a key.

V.A.D. Road Services.

At the Voluntary Aid Detachment gathering at Aboyne, the proposal was discussed to utilise the services of V.A.D. nurses for first-aid and other work in connexion with road accidents. Dr. J. C. M. Matheson, of Laurencekirk, said that headquarters had expressed their approval of the scheme, and he was hopeful of seeing all arrangements in Kincardineshire completed shortly. War was a very remote possibility, and a vigorous effort should be made to deflect the training and experience of many capable nurses into the service indicated.

The movement is also receiving support in Aberdeen, and is expected to spread to other counties in Scotland.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Censorship of Publications.

IMMEDIATELY before the adjournment of the Dail the first reading was taken of the Censorship of Publications Bill, 1928, a measure designed to prohibit the sale and distribution of unwholesome literature. The text of the Bill has, however, been issued only within the past few days. Apart from its purely moral and social aspects the Bill has special interest for the medical profession. It is proposed to set up a board of five censors, on the report of four of whom the Minister of Justice may issue an order prohibiting the sale or distribution of a book regarded by them as indecent or obscene, or tending to inculcate principles contrary to public morality, or of such character that it tends to be injurious or detrimental to or subversive of public morality. Similar action may be taken in regard to a periodical, recent issues of which may be adjudged to have offended. Disobedience to an order may be punished by fine or imprisonment, or both, and, in any case, forfeiture of the book or periodical. Special sections limit the publication of certain matters in relation to divorce proceedings or other proceedings dealing with the marital relation, and legal proceedings in general. The Bill, however, goes much further than this. *It prohibits, otherwise than in accordance* with a permit granted by the Minister, the publication, selling, or keeping for sale, and the distribution of *any book or periodical* which *advocates* or might reasonably be supposed to advocate the unnatural prevention of conception or procurement of abortion *or miscarriage, or any method*, treatment, or appliance to be used for the purpose of such prevention or procurement. Moreover, the printing of advertisements which relate or refer to any disease affecting the generative organs of either sex, or to any complaint or infirmity arising from or relating to sexual intercourse, or to the prevention or removal of irregularities in menstruation, and certain other matters, is brought under the Indecent Advertisements Act of 1889. Another section deals with the exposure of indecent pictures.

Much of the proposed legislation deserves commendation. The prohibition of the advertisement of quack cures for venereal diseases and of "cures for female irregularities" is long overdue. Few will quarrel, except perhaps on academic grounds, with the limitation of the reporting of divorce and similar legal cases—a reform already adopted in England. But the virtual branding of propaganda in favour of birth control as indecent will take many aback. The ethics of birth control are a subject of lively controversy at the moment, and the ethical question can hardly be settled by a legislative enactment. *In regard to other* matters there is a grave danger that if a board of puritanical or uncultured censors should be appointed, both literature and art would *speedily* feel themselves cramped.

Royal Institute of Public Health.

The annual congress of the Royal Institute of Public Health was opened in Dublin last Tuesday evening by a reception given by the Minister of Local Government and Public Health, who is President of the Congress. On the following and subsequent days the several sections met for discussion.

A LANCASHIRE REST HOME.—The Directors of British Insulated Cables, Ltd., of *Prescot*, Lancashire, have bought Upper Downing, Flintshire, for a rest home as part of an after-care scheme for sickness and accident cases among their employees. The cost of *maintenance* will be defrayed by the Hospital Fund Committee of the employees. Upper Downing, which by now has been opened, was built in 1589, *but* was *remodelled* in the Georgian period. It stands close to Downing Hall, long the *home of Thomas* Pennant, traveller and naturalist.

GENERAL MEDICAL COUNCIL.

EXECUTIVE COMMITTEE.

AT a meeting of the Committee, held on July 23rd, Sir Norman Walker was appointed a member of the Dental Board in the place of the late Sir James Hodsdon.

Restorations to the Register under Section 14.

The following names, erased owing to failure to reply to the Registrar's inquiry, were restored to the Medical Register:—

Thomas Allen, Robert J. Baylor, Chas. Wm. Dixon, John Douglas, John Dwyer, Mervyn Eager, Lennard Game, Harold W. Hodgson, M.C., Elizabeth S. Martin, Vivian Matthew Matthews, Evelyn Arthur Rich.

Direct Representative.

A letter was read from Sir Robert Bolam, resigning his membership of the Council as a Direct Representative on his appointment as Representative of the University of Durham. The vacancy thus caused will be filled by an election to be held before the November Session, at the same time as the election of a Direct Representative to fill the vacancy caused by the death of Dr. Macdonald.

Union of South Africa Medical Act.

A copy of this Act, which also relates to the mandated territory of South-West Africa, was received from the Dominions Office. This Act provides that the Governor-General, after considering any recommendation by the Council, may prescribe by regulation the diplomas, &c., which entitle to registration provided that they entitle the holder to practise in the country in which the body granting it is situated, that there is reciprocity between the Union and the country, and that the standard is not lower than that required in the Union. The Governor-General may make regulations for the registration of medical and dental students. Any unregistered person who practises as a medical practitioner, or performs any act specially pertaining to the calling of a medical practitioner, or pretends to be a medical practitioner, is liable to a fine not exceeding £100. There are similar penalties provided in regard to dentistry. The use of the British Pharmacopœia is enjoined. No registered person may make extortionate charges for services rendered, and if the fee exceeds that usually charged he must, before rendering the service, inform the person concerned of the fee which it is intended to charge. Persons mentally disabled may be suspended from carrying on their profession.

North Australia.

Information was received from the Dominions Office relating to the practice of medicine and surgery in the Territory of North Australia. It appears that the South Australia Acts of 1844, 1880, and 1889 were in force in 1910 when the Northern Territory came under the authority of the Commonwealth, and still hold. The Act of 1844 states that no one shall be deemed a legally qualified medical practitioner unless he shall have proved to the satisfaction of the Medical Board that he held a satisfactory qualification. In the Act of 1880 this was repealed, and it was enacted that no one was to be deemed a medical practitioner unless he possessed one of the qualifications contained in the Schedule. The Schedule, however, was not supplied. In the Act of 1889 the Schedule was repealed, and a new Schedule was appended, which included any qualification entitling to registration in the United Kingdom, a degree of any University in Australasia legally authorised to grant it, and a degree or diploma granted by any body in a British Colony or Possession, or any foreign University which in the opinion of the Medical Board was equal to a qualification entitling to registration in the United Kingdom.

Indian Qualifications.

A communication from the India Office supported a request by the University of Bombay for the extension of the recognition of its M.B., B.S. degree of the University for a further period of three years. The question of appointing a Commissioner of Qualifications and Standards pending the creation of a Medical Council for India has, it was stated, been referred by the Government of India to the local Governments for their consideration. Their replies have not yet been received. It was resolved to recognise for one year the medical degrees of Bombay, Calcutta, Madras, and Punjab Universities, until July 31st, 1929, subject to the receipt (before July 1st, 1929) by the Council of a satisfactory report by an inspector or inspectors appointed by the Government of India and approved by the Council on a Final Examination held in the academic year, 1928–29.

Training of Midwives.

In view of the appointment by the Ministry of Health of a Committee to deal with the functions and training of midwives, it was resolved to ask Sir Donald MacAlister to attend before the Committee on Oct. 24th to explain the general views of the Council, and to introduce Mr. Eason, Sir Leslie Mackenzie, and Mr. Johnston, who should be requested to give evidence relating to the three divisions of the Kingdom.

Definition of Abortion.

At a previous meeting of the Committee, doubt was expressed as to whether the definition of "abortion" in the amended Rules of the Central Midwives Board was sufficiently clear or accurate. The Ministry of Health stated that the definition had been altered to read as follows:—

> "The passage of the contents of the uterus before the fœtus is viable—that is, of an age at which it may be reasonably expected to survive. (Note.—For practical purposes a fœtus is not viable before the twenty-eighth week of pregnancy.)"

Obituary.

GEORGE EDWARD WHERRY, M.CHIR. CAMB., F.R.C.S.ENG.

WE regret to announce the death of the well-known Cambridge surgeon, Mr. Wherry, which occurred on August 12th, in the seventy-seventh year of his age. The whole of his professional life was spent in the University city, and the number of Cambridge medical graduates who have regarded him as a friend, both during their undergraduate days and later, must be enormous.

George Edward Wherry was born at Bourne, in Lincolnshire, received his early education at the local grammar school, and, entering the medical school of St. Thomas's Hospital in 1870, obtained his first diploma, M.R.C.S.Eng., at the age of 21. From St. Thomas's Hospital he proceeded to Cambridge as house surgeon at Addenbrooke's Hospital, being admitted at the same time to Downing College as an undergraduate of the University. He held the resident post at Addenbrooke's for four years, and during that time graduated in arts at the University. He took the M.B., B.Ch. degree in 1878, and in the following year he proceeded to that of M.C. In the same year he took the Fellowship of the Royal College of Surgeons of England, and was appointed surgeon to Addenbrooke's Hospital.

In 1883 Sir George Humphry, to whom Wherry owed his original connexion with Addenbrooke's Hospital, resigned the Professorship of Anatomy to take the new and unpaid Professorship of Surgery, and in the same year a University Lectureship in Surgery was established, when Wherry was appointed to the post and held it until its suppression nearly thirty years later. He was never actually Professor of Surgery. This post was not filled up for seven years after Humphry's death in 1896, when in 1903 Howard Marsh, while still connected with St. Bartholomew's Hospital, was invited to the chair. Four years later Marsh became Master of Downing College, and held the post of Professor until his death, since which it has not been filled up. But if Wherry was never professor in name, no professor could possibly have been more closely associated with the science of surgery as a University subject or more keen for its development than he was. He lectured assiduously, held clinical classes in the wards, acted frequently as an examiner, and supervised during the ten years immediately following the death of Howard Marsh the whole surgical faculty of the University.

Outside his professional work Wherry was well-known to a large circle as an Alpine climber, an antiquarian, and a man of diverse and highly cultivated literary tastes. He married in 1881 Albinia Lucy, daughter of Robert Needham Cust, of the Bengal Civil Service, by whom he had one daughter, who became the wife of Major R. W. Oldfield, Military Attaché to the Legation at Prague.

CHRISTOPHER CHILDS, M.D.Oxf., D.P.H.Camb.

THE death took place on Monday, August 6th, at his residence, Rock House, West Looe, Cornwall, of Dr. Christopher Childs, a well-known pioneer in sanitation and epidemiology. He had reached the age of 81.

Christopher Childs was born at Liskeard, and received his early education at Uppingham School, where he was distinguished alike in work and play, being an exhibitioner, a great runner, and the captain of the football fifteen. From Uppingham he proceeded to Merton College, Oxford, and graduated with a first class in the Natural Science Tripos. Deciding to enter the medical profession, and having won the Radcliffe Trust Special Prize, he completed his clinical course at St. George's Hospital, took the diplomas of the English Colleges, and became house physician to the institution. London practice, however, had no great attraction for him, and for a short time he returned to his old school as science master, when he was able to assist the famous head, Edward Thring, during a dramatic transference of the school from Rutlandshire to Wales, following upon an outbreak of typhoid fever. In 1882 he decided to commence general practice at Weymouth, and for some 12 years he conducted a large practice in that town and neighbourhood, but again he felt that he had not found the career that most appealed to him. At this time the problems of public health and sanitation became more obviously attractive to the medical man with special scientific equipment. In 1895 Childs acquired the diploma of D.P.H. at Cambridge, and left Weymouth for Manchester-square to practise as a sanitary expert. He was accepted quickly as an authority, wrote ably upon epidemiological subjects, and in particular made some comparative studies of typhoid fever epidemics which well represented the knowledge of the time. He lectured on bacteriology and hygiene at University College, London, and examined in those subjects for the English Conjoint Board.

He retired, however, while still in middle age, and removed to Looe, where he passed the last twenty-four years of his life devoting himself to the public welfare of the town, and, indeed, of his native county, being particularly interested in the fortunes of the Cornish fishing industry and the promotion of ambulance work. He was a Knight of Grace of the Order of St. John of Jerusalem.

One who had been his pupil at Uppingham writes: "Childs was a man whom those of his juniors who came into contact with him will always remember as an old friend. Uppingham, during his brief term of office as a science master, was mainly a classical school, and it is doubtful if Childs would have occupied a position of real authority among us had it not been for his personal kindliness and his record on the playing field as athletic champion and captain of football. But the few of us who worked under him in his simply equipped laboratory gained an insight into the beginnings of scientific work which made the later approach to serious study far easier for us."

Dr. Childs married Miss Anne MacRea, of Weymouth, who predeceased him, and by whom he had one son.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. S. G. Rainsford to be Surg. Lt.-Comdr.

The following appts. are notified: Surg. Rear-Admiral H. C. Whiteside is placed on books of *President* while attending conference of Association of Military Surgeons of the United States. Surg. Comdrs: F. C. Wright to *Vindictive*; A. C. Anderson to *Argus*; J. Bourdas to *Victory* for R.N. Barracks, Portsmouth; and H. M. Langdale to *Vernon*. Surg. Lts. E. T. S. Rudd to *Pembroke* for R.M. Infirmary, Chatham; T. Rees to *Hood*; A. S. Nicol to *Impregnable*; D. R. Campbell, L. J. Corbett, and S. J. Savage to *Broke* (on recommg.). Surg. Lt.-Comdr. (D.) B. J. Geekie to *Malabar* for R.N. Hospl., Bermuda.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. W. C. Croly retires on retd. pay.

Maj. C. Clarke, Reg. Army Res. of Off., relinquishes his appt. and resumes the rank of Lt.-Col.

The undermentioned Lts. (on prob.) are confirmed in their rank: F. McL. Richardson, J. W. Eames, and S. R. M. Mackay.

TERRITORIAL ARMY.

Capt. E. White (late R.A.M.C.) to be Lt. and relinquishes the rank of Capt.

W. F. Mulvey to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Col. A. Greenwood, having attained the age limit, relinquishes his commn. and retains his rank.

ROYAL AIR FORCE.

Flight Lt. H. W. Corner is granted a permanent commission in this rank.

Capt. W. R. Wotton (Army Dental Corps) is granted a temporary commission as a Flight Lt. (Dental) on attachment to the R.A.F.

Flight Lt. (Hon. Sqdn. Ldr.) J. W. H. Steil relinquishes his temporary commission on completion of service and is permitted to retain his rank.

INDIAN MEDICAL SERVICE.

C. L. Noble to be Lt.

Sunderdas Tulsidas Sodah to be Temp. Lt.

ROYAL ARMY MEDICAL COLLEGE.

The following prizes were awarded at the conclusion of the summer course for Lieutenants on probation, R.A.M.C., and I.M.S., at the Royal Army Medical College, Grosvenor-road, London, S.W.: Herbert prize (about £20): Highest aggregate marks, Lt. F. McL. Richardson, R.A.M.C. First Montefiore prize (£20 and bronze medal): Highest marks in military surgery, Lt. A. McMillan, R.A.M.C. Second Montefiore prize (£7): Second highest marks in military surgery, Lt. S. S. Bhatnagar, I.M.S. Parkes Memorial (medal and £5): Highest marks in hygiene, Lt. F. McL. Richardson, R.A.M.C. Ranald Martin (medal and £5): Highest marks in tropical medicine, Lt. F. McL. Richardson, R.A.M.C. Tulloch Memorial (silver medal): Highest marks in pathology by an R.A.M.C. officer, Lt. G. T. L. Archer. Fayrer Memorial (bronze medal): Highest marks in pathology by an I.M.S. officer, Lt. C. J. F. Cropper. De Chaumont prize: Second highest marks in hygiene, Lt. S. R. M. Mackay, R.A.M.C.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

CHANGES IN PENSIONS ADMINISTRATION.

BEFORE the prorogation of Parliament, on Friday, August 3rd, some important questions of policy in the assessment of post-war disability pensions and the medical treatment of pensioners came up.

On the motion for the third reading of the Consolidated Fund (Appropriation) Bill,

Sir ROBERT HUTCHISON said, in view of the important statement made by the Minister of Pensions recently, he took that opportunity of raising some important points. There was one point in the statement on which he would like some elucidation—namely, the question of allowances for treatment. They had now got so far away from the war that many of those who were still suffering from wounds, from the affects of gas, and from nervous disability could be considered chronic, and their condition was on quite a different plane from what it was ten years ago. He suggested that there were a great many cases which would be much better cared for in regular institutions where their condition might be ameliorated. They knew of cases where people had been sent for treatment again and again by medical boards, and the nervous exhaustion of the individuals who had to undergo that treatment, and in some cases operations, was pitiful. Some attention ought to be given to this very serious matter. His next point was as to the continuance of re-examination before medical boards for re-assessment of pensions in quite a small number of cases. The argument was used that after a final assessment and the giving of a final pension there were cases that got worse; but statistics would prove that almost 95 per cent. of the cases that had been given final awards did not come up for re-assessment. It seemed to him that the time had arrived when the Ministry should deal generously with the remaining cases, and give them a final pension, even though it might be to the detriment of the State. The amount of money involved must be small compared with the total expenditure. The Government might also consider a definite proposal for closing down the Ministry of Pensions step by step over a period of a few years. Large blocks of people could be given a statutory right to their pensions which would be paid through the Post Office, and the cases which fell for continual attention might be handed over to institutions, or to the care of the medical authorities through the Ministry of Health. In that way money could be saved in a direction in which, at present, there was extravagance considering the work which had to be done. The statement made by the Minister as to the stabilisation of pensions had gladdened the hearts of many, but the more they could close down the Ministry the better it would be for all concerned.

Mr. F. ROBERTS said that the House agreed that the Government had taken the right and proper course in the stabilisation of war pensions. He would offer resistance to Sir R. Hutchison's proposal with regard to the closing down of the Ministry of Pensions. They recognised that there must be some contraction of the work, but the more they looked around the more they understood how big the question was that confronted them, and how important it was to have a Minister in the House of Commons who could be questioned in regard to the problems affecting ex-Service men. It was essential to maintain this Department, with its voluntary workers and officers throughout the country, in order to keep in operation that human touch which was more necessary in connexion with pensioners than perhaps any other department of our social life. If the Minister of Pensions and the Government were not prepared to accept the view that there should be no time limit, and that if a man was suffering from a war disability, he should thereby be entitled to pension, then he (Mr. Roberts) would ask the right hon. gentleman to what extent he was prepared to go in meeting the needs of those neurasthenic and tuberculous cases which from time to time were such a source of great anxiety. He would also like to ask the Minister whether it was his intention to provide special treatment for border-line cases, in regard to which it was doubtful whether the policy applied was that which Parliament and the country desired.

The Future of the Ministry of Pensions.

Lieut.-Colonel FREMANTLE said he would like to speak from the point of view of the medical service and medical administration in the Ministry of Pensions. It was sometimes forgotten that the Ministry of Pensions was a most influential part of the health services of the nation, although it was divorced from the general health services. They were all immense admirers of the Minister of Pensions and the work of his staff, but the stoutest defender of the Ministry as a separate entity must admit that it would come to an end one of these days, and it was right that they should envisage the future and try and consider to what extent it was likely to be changed. After they had stabilised the greatest number of pensions this largely became a medical question. From the medical point of view one obviously supposed that before the general body of pensioners had passed into another world rather than have the whole system of treatment of the few that remained die of inanition, the duties of the Department would have to be passed over to some other Department, and the question was how soon that should take place. It was quite true that that was not a question of immediate politics; but it was obvious that sooner or later the responsibility for the institutions and the personnel would have to be transferred. The natural body to complete and wind up the service would seem to be the Ministry of Health, but that would associate itself in their minds with the poor-law guardians, and there had always been a great and natural reluctance to imagine the possibility of in any way fusing this service with the service of the poor-law guardians. The proposal of the Government in the big Bill foreshadowed for next session was, however, to transfer the whole system of the poor-law into the hands of larger authorities—the county councils and the county borough councils—and he thought they would there have a new envisagement of institutional treatment and public health. They would have larger authorities possessing an enlarged service of institutions with a very large field of employment; because, if the new Bill passed substantially in the form in which it was proposed, they would be taking over the whole of the services of that kind, whether they were in the hands of the guardians or those of the district sanitary authorities. He was not going to say straight away that that in itself would qualify them to take over, or operate, the services of the Ministry of Pensions, but it was obvious that it gave them a prima facie reason for believing that they would be the body for that purpose. All that, however, was in the future, and they would, first of all, have to see how this reform worked out. When the counties had produced their schemes and got to work for a year or two, it would be possible to judge whether they would be able to relieve and help the Ministry of Pensions in this work. The Minister would have to consider what was to be the future of his institution and his personnel. The personnel must be a gradually diminishing one, but it would be a very difficult thing to know how to deal with it. There was a whole series of eminent medical men who had given themselves up to the Pensions service, who were chosen for work at the end of the war as the result, perhaps, of their war service, and it would be a difficult thing to turn those men out of the service and give them no future at all. In the same way with institutions; it would be a bad thing to see institutions contracting and becoming less efficient while they had to undertake big schemes for their fusion with all the geographical difficulties that would entail on pensioners and in other directions. Therefore, it was right that the Ministry should envisage the possibility of bit by bit gradually working in and coöporating with the Ministry of Health, and eventually the county and county borough councils, for the gradual fusion of the two services for which, in so far as pensions were concerned, the Ministry of Pensions would naturally retain its responsibility. Only at a later stage would the Minister transfer the institutions to the Ministry of Health.

They had to consider yet another side, and that was the future of the whole of these institutions with their personnel, and this service which had been built up by the present Minister of Pensions and his predecessors. They had developed a new medical science. This subject of the assessment of liability and the attributability of disease to war, with all its difficulties, had been developed by this service, and had become a fine art akin only to the medical service in connexion with insurance. It would be invaluable to the nation as a whole. The institutions with their specialist forms of treatment, as well as their general forms of treatment, had attained a very high professional position, and a high degree of skill and equipment. The great pity was that that should not be made available to the civil population in the future. If the personnel and the institutions were left gradually to slide down and down, though living an independent life, they would lose their standing and value in a large degree before they were transferred to the civil side. The Minister of Pensions should be considering in what way he could coöperate with the Ministry of Health and the other civil authorities in catering for some of the civil needs of the population, and in that way help to keep alive his institutions and maintain them at their highest possible pitch of fitness.

Dr. DRUMMOND SHIELS said he was unable to join in th mild congratulations which had been generally given to th

Minister, because he was thoroughly dissatisfied both with the policy and the spirit of the Ministry of Pensions. He agreed that it was very desirable that they should have had an intimation that week on the stabilisation of pensions, although *in effect* it only meant that after 1931 the present position of pensions was to continue. He did not criticise the present Minister specially, except that he thought he had been more accommodating to pressure from the Treasury than any other Pensions Minister. The Pensions Ministry had been under the domination of the Treasury ever since January, 1920. He could bring forward any number of cases which had gone through his hands where men had undoubtedly suffered in health very seriously because of the war but were receiving no pension, or only a miserable pension. Lieut.-Colonel Fremantle had spoken about the medical point of view. He (Dr. Shiels) was not particularly concerned at present about the future organisation of the Ministry. The medical point of view in which he was interested in connexion with the Ministry of Pensions was the way in which the Ministry turned down the opinions of medical men, not only panel doctors, many of whom were extremely and naturally indignant, but also well-known specialists, whose opinion was flouted by the Ministry of Pensions. He was not sure that it was by the medical men in the Ministry of Pensions. The medical men in the Ministry were not supreme. But they all knew of cases where a man was told that his case was one which made home treatment suitable; he did not require any hospital treatment, but his case could be dealt with by his panel doctor. He went to the panel doctor, and the panel doctor examined him and said that in his opinion the man required either hospital treatment or specialist treatment, and sent him back to the Ministry. Then the man was pushed backwards and forwards and was refused the treatment which the panel doctor thought was desirable. Even the opinions of medical specialists were set aside. He (Dr. Shiels) thought the Ministry of Pensions should give more heed to the opinions of conscientious medical men who knew the patients, and in many cases knew them before the war, and who understood the change that had taken place.

Mr. MONTAGUE said he did not altogether agree with Dr. Shiels in reference to the point raised by Lieut.-Colonel Fremantle, because he thought that Colonel Fremantle's reference to the use of an efficient State medical service for the civil population was a very big advance towards the point of view that the Labour Party held in regard to medicine and the nation as a whole.

The Minister's Reply.

After further debate,

Major TRYON, Minister of Pensions, said that as a result of the work of a committee presided over by Sir Godfrey Collins, the problem of artificial limbs for ex-Service men had been most satisfactorily settled. He believed that the limbs now supplied were probably the best supplied by any country which took part in the war. He had seen a suggestion that the 6000 men who had lost their reason would get nothing if it was not for the ex-Service Men's Welfare Society. That was a statement which no doubt enabled the Society to obtain funds from the charitable public, but it was absolutely untrue, because that Society under the law was not able to deal with a single one of the 6000 mentally afflicted men in the asylums; and so far from it being the case that the State had done nothing for them, the State had for many years past been spending about £3,000,000 a year on mental cases alone. The doctors of the Ministry were doing a wonderful work for these cases. He did not think the country generally realised how much the ex-Service men owed to the wonderful work which had been done for the sick and disabled by the medical staff of the Ministry. It was true, as Colonel Fremantle had said, that medical science had advanced, and he was glad to see that in a hospital which had hitherto been doing much work for the ex-Service men the great experience gained in connexion with the loss of limbs had been used to help railway men who had lost their limbs in civil employment. In that way they hoped to carry on the medical experience gained through these terrible sufferings, in order that the knowledge so obtained might be of assistance in civil life to other sufferers.

The Bill was read the third time.

SHEFFIELD PENNY-IN-THE-POUND SCHEME.—It is officially stated that this fund will this year be able to distribute £100,000 among the four Sheffield hospitals. Last year the amount so distributed was £88,809, out of a total of £116,816. The balance was expended upon the ambulance, convalescent, and other services. At the end of 1927 the joint debt of the Sheffield hospitals was £59,000 as against £111,000 twelve months earlier.

Correspondence.

"Audi alteram partem."

THE HEART AND CIRCULATION IN BERI-BERI.

To the Editor of THE LANCET.

SIR,—In the St. Cyres lecture, published in your last issue, Prof. Wenckebach has dealt with the problems of the beri-beri heart, and has supplied a most interesting and suggestive explanation of the difficulties met with. At the same time he has introduced a new view of the mechanics of the heart and circulation in connexion with the action of the right and left ventricles. This new view may be correct, but as its acceptance entails the dropping of well-established beliefs some caution is required.

The leading features of the beri-beri heart would appear to be dilatation and weakening of the right ventricle, weakening of the left ventricle, increasing stasis in the liver and venæ cavæ, and a pulmonary *circulation completely free from any sign of stasis.* These phenomena taken by themselves would suggest a condition of congestive heart failure, but Prof. Wenckebach has accepted the statements of the authorities on this disease that the chief lesion is in the right ventricle, and that the circulatory disturbances are due to its failure. He says that clinical experience has taught him "that in cases of increasing insufficiency of the whole heart the right heart is doomed beforehand to suffer much more than the left, and even to suffer to the profit of the latter." This can only be tested by the effect on the circulation. In cases of the beri-beri heart the pulmonary circulation goes on unimpaired, so that one *may* assume an efficiency of action and an absence of suffering as regards the right ventricle. On the other hand, congestion of the liver and large veins, with a feeble apex beat and a weak, rapid pulse, suggests that it is the left ventricle which is in difficulty. The teachings of clinical experience as given above may be right or may be wrong, but they do not seem to find much support in the clinical features of the beri-beri heart.

The great function of the right ventricle is to carry on the pulmonary circulation. In the beri-beri heart the weakened and dilated right heart develops incompetence of the tricuspid valve; Prof. Wenckebach says that "blood passes from the right heart backwards into the veins and liver, and the arterial output of the right ventricle is greatly reduced." Here we have the back-pressure theory in all its nakedness, but in spite of this failure of the right heart, "there is no lung stasis, no râles, and no pulmonary œdema." In short, this disabled and dilated right ventricle is carrying on its normal function most efficiently, and at the same time is doing extra work in pumping the blood back into the venæ cavæ and liver until they are gorged with blood. But this is not all the trouble of the right ventricle. "The right heart has to deal with the whole volume of blood returning from the periphery to the heart, *the left heart not receiving more blood than the right heart is able to transmit.* Consequently the right heart is all the time struggling for life against an ever-increasing overfilling and widening, but the left heart is spared a similar burden." But why this life and death struggle of the right heart? Is it so clear that it is the action of the right heart which has over-distended the venæ cavæ and liver? No action or inaction of the right ventricle can produce such stasis of the venæ cavæ and liver when at the same time an efficient pulmonary circulation is being carried on. One can conceive that the right heart may fail to carry on an efficient pulmonary circulation, with some reflux through the tricuspid valve, or that the right heart may carry on the pulmonary circulation efficiently without such reflux, but one cannot conceive that the right heart should be carrying on the pulmonary circulation successfully and at the same time be pumping the liver full of blood. The closing stages of the beri-beri heart are no less puzzling, for now, at long last, the left ventricle comes into the picture. "At the last moment before death the latter loses its systolic power, succumbs, and leaves the lungs with stagnating blood and signs of ante-mortem œdema." Surely these pulmonary signs are to be traced to a failure in action of the right and not of the left ventricle, and they happen to be the first unequivocal signs of right-sided failure which the lecturer has described in connexion with the beri-beri heart.

Prof. Wenckebach seems to have accepted the statements of the authorities on beri-beri as to the special cardiac changes present, and on this basis he has built a new theory of cardiac physics. He promulgates a new law of the heart as follows: "In equal and increasing feebleness of the whole heart muscle the patient suffers most and dies from the failure of the right side of the heart only." The beri-beri heart may require new views of the circulation and new laws of the action of the two sides of the heart, but there is still something to be said for the old ones. In the beri-beri heart the left ventricle is weakened and the rate is increased. The signs of right-sided failure on which so much stress has been laid might more convincingly be explained by failure of the left ventricle. The engorgement of the liver and large veins, ascribed to the back pressure from the right heart, is now usually ascribed to the diminished forward pressure of the left ventricle. It is the characteristic sign of a failing left ventricle. The total absence in beri-beri of signs of disturbance in the pulmonary circulation—no stasis, no œdema, no dyspnœa—would indicate a right ventricle working at its ease and well within its powers. The arterial output of the ventricle must be quite up to normal, and if at the same time it is pumping blood into the liver, while its muscle is seriously weakened by disease, we have indeed a phenomenon which requires some new law.

Prof. Wenckebach was an honoured guest of the Royal College of Physicians at the recent Harveian celebrations, and saw the demonstration by Sir Thomas Lewis of Harvey's original experiments. Might I suggest that he test the truth of his new views, in the manner of Harvey, by some physiological experiments to show the circulatory correlation between the two sides of the heart? It was not Harvey's theories, but his experiments which carried conviction to the sceptics of his time, and no doubt the same would apply to-day.

I am, Sir, yours faithfully,

London, August 12th, 1928. G. A. SUTHERLAND.

HERPES ZOSTER AND VARICELLA.

To the Editor of THE LANCET.

SIR,—I read with interest the note on p. 264 of THE LANCET, August 4th, and while reports of the development of the two maladies side by side are now too frequent to be of much interest, yet I cannot refrain from mentioning a small epidemic of chicken-pox I saw recently. Occurring as it did in an isolated island district where there was little possibility of outside infection the relationship between the illnesses was very definite.

On Jan. 6th last I was called to see a case of herpes zoster in a woman who had a definite history of previous debility and gastric disturbance. The rash had developed two days before and was unilateral along the course of the right seventh intercostal nerve. On Jan. 12th I was called to see her son aged 25 who had a most profuse and typical varicella with considerable constitutional disturbance, including a sore throat and total suppression of urine for 24 hours. On Jan. 13th a nephew aged 8 years, who had slept with his aunt for several nights and had then returned to his own home about a quarter of a mile away during the week prior to the development of her herpes, developed varicella. He had not been near the house after my visit on Jan. 6th. On Jan. 22nd the child's small brother and sister and a playmate simultaneously developed varicella but showed much less constitutional disturbance.

The cases caused considerable interest and alarm amongst the cottars, who could hardly believe in the origin of chicken-pox. A few years ago my principal had a case of an elderly lady visiting a sick child on her estate. The illness was found to be chicken-pox, and about a fortnight later the lady developed a very severe attack of herpes zoster.

I am, Sir, yours faithfully,

FLORA L. MACDONALD, M.B., Ch.B.,
Assistant General Practitioner.

Isle of Mull, August 11th, 1928.

POST-OPERATIVE MASSIVE COLLAPSE OF THE LUNGS.

To the Editor of THE LANCET.

SIR,—We read with great interest Dr. K. D. Wilkinson's letter in your issue of August 4th (p. 257). In our communication the term collapse is used exclusively in the sense that Pasteur originally intended it—namely, to indicate a complete apneumatosis of the affected lung, deflation being applied to the varying degrees of shrinkage that can occur without complete airlessness. We suspect that Dr. Wilkinson does not intend a similar distinction and this may account, in part, for his attitude towards our theories.

It is recognised that the assumption of the supine position in any circumstances is accompanied by a definite decrease in the vital capacity, or deflation of the lungs. It is our contention that following abdominal operations this is increased by a limitation of the respiratory movements which is partly reflex and partly voluntary in origin. This additional influence is most marked following upper abdominal operations, and for purely mechanical reasons it affects the lower more than the upper lobes, and these in males more than females, but the resulting deflation can never be more extreme than that of forced expiration, and apart from active compression there is only one method by which the lung can become completely airless, that is absorption of the alveolar air following obstruction of the bronchial tree.

The onset of post-operative massive collapse following the obstruction of a bronchus may be insidious, the physical signs when the block is complete being those which have been described as "dead lung." The sign of consolidation appearing only when the obstruction is removed without aeration of the alveolar tissue, but when a lobe which is already deflated becomes collapsed because of the diffuse obstruction of the bronchioles, the initial signs may suggest consolidation, followed later by those of "dead lung," because of the accumulation of secretions, and later still by those of consolidation when these secretions are removed. We think that examination of this hypothesis will explain many of the difficulties which Dr. Wilkinson raises. It is not at variance with a known physiological fact and it does not necessitate the assumption of anything which cannot be confirmed experimentally. We submit, however, that although Dr. Wilkinson's very ingenious theory might account for extreme deflation of the lung it could not account for the absolute airlessness which we regard as an essential of massive collapse.

We have had no personal experience of massive collapse occurring after gun-shot wounds of the chest and elsewhere, but feel that they can be explained by bronchial obstruction, and in this connexion we think that insufficient attention has been given to Curl's observation, that even non-pentrating wounds of the thorax are followed by bronchial hypersecretion which is often almost confined to the opposite lung, due in his opinion to a contrecoup mechanism such as occurs in cranial injuries. Given this hypersecretion and voluntary suppression of the expulsive efforts it is easy to see how bronchial obstruction may arise.

We agree as to the necessity of administering an efficient pre-operative and in some cases a post-operative dose of atropine, and suggest that the favourable reports which Mr. Hamilton Whiteford

Minister, because he was thoroughly dissatisfied both with the policy and the spirit of the Ministry of Pensions. He agreed that it was very desirable that they should have had an intimation that week on the stabilisation of pensions, although in effect it only meant that after 1931 the present position of pensions was to continue. He did not criticise the present Minister specially, except that he thought he had been more accommodating to pressure from the Treasury than any other Pensions Minister. The Pensions Ministry had been under the domination of the Treasury ever since January, 1920. He could bring forward any number of cases which had gone through his hands where men had undoubtedly suffered in health very seriously because of the war but were receiving no pension, or only a miserable pension. Lieut.-Colonel Fremantle had spoken about the medical point of view. He (Dr. Shiels) was not particularly concerned at present about the future organisation of the Ministry. The medical point of view in which he was interested in connexion with the Ministry of Pensions was the way in which the Ministry turned down the opinions of medical men, not only panel doctors, many of whom were extremely and naturally indignant, but also well-known specialists, whose opinion was flouted by the Ministry of Pensions. He was not sure that it was by the medical men in the Ministry of Pensions. The medical men in the Ministry were not supreme. But they all knew of cases where a man was told that his case was one which made home treatment suitable; he did not require any hospital treatment, but his case could be dealt with by his panel doctor. He went to the panel doctor, and the panel doctor examined him and said that in his opinion the man required either hospital treatment or specialist treatment, and sent him back to the Ministry. Then the man was pushed backwards and forwards and was refused the treatment which the panel doctor thought was desirable. Even the opinions of medical specialists were set aside. He (Dr. Shiels) thought the Ministry of Pensions should give more heed to the opinions of conscientious medical men who knew the patients, and in many cases knew them before the war, and who understood the change that had taken place.

Mr. MONTAGUE said he did not altogether agree with Dr. Shiels in reference to the point raised by Lieut.-Colonel Fremantle, because he thought that Colonel Fremantle's reference to the use of an efficient State medical service for the civil population was a very big advance towards the point of view that the Labour Party held in regard to medicine and the nation as a whole.

The Minister's Reply.

After further debate,

Major TRYON, Minister of Pensions, said that as a result of the work of a committee presided over by Sir Godfrey Collins, the problem of artificial limbs for ex-Service men had been most satisfactorily settled. He believed that the limbs now supplied were probably the best supplied by any country which took part in the war. He had seen a suggestion that the 6000 men who had lost their reason would get nothing if it was not for the ex-Service Men's Welfare Society. That was a statement which no doubt enabled the Society to obtain funds from the charitable public, but it was absolutely untrue, because that Society under the law was not able to deal with a single one of the 6000 mentally afflicted men in the asylums; and so far from it being the case that the State had done nothing for them, the State had for many years past been spending about £3,000,000 a year on mental cases alone. The doctors of the Ministry were doing a wonderful work for these cases. He did not think the country generally realised how much the ex-Service men owed to the wonderful work which had been done for the sick and disabled by the medical staff of the Ministry. It was true, as Colonel Fremantle had said, that medical science had advanced, and he was glad to see that in a hospital which had hitherto been doing much work for the ex-Service men the great experience gained in connexion with the loss of limbs had been used to help railway men who had lost their limbs in civil employment. In that way they hoped to carry on the medical experience gained through these terrible sufferings, in order that the knowledge so obtained might be of assistance in civil life to other sufferers.

The Bill was read the third time.

SHEFFIELD PENNY-IN-THE-POUND SCHEME.—It is officially stated that this fund will this year be able to distribute £100,000 among the four Sheffield hospitals. Last year the amount so distributed was £88,809, out of a total of £116,816. The balance was expended upon the ambulance, convalescent, and other services. At the end of 1927 the joint debt of the Sheffield hospitals was £59,000 as against £111,000 twelve months earlier.

Correspondence.

"Audi alteram partem."

THE HEART AND CIRCULATION IN BERI-BERI.

To the Editor of THE LANCET.

SIR,—In the St. Cyres lecture, published in your last issue, Prof. Wenckebach has dealt with the problems of the beri-beri heart, and has supplied a most interesting and suggestive explanation of the difficulties met with. At the same time he has introduced a new view of the mechanics of the heart and circulation in connexion with the action of the right and left ventricles. This new view may be correct, but as its acceptance entails the dropping of well-established beliefs some caution is required.

The leading features of the beri-beri heart would appear to be dilatation and weakening of the right ventricle, weakening of the left ventricle, increasing stasis in the liver and venæ cavæ, and a pulmonary circulation completely free from any sign of stasis. These phenomena taken by themselves would suggest a condition of congestive heart failure, but Prof. Wenckebach has accepted the statements of the authorities on this disease that the chief lesion is in the right ventricle, and that the circulatory disturbances are due to its failure. He says that clinical experience has taught him "that in cases of increasing insufficiency of the whole heart the right heart is doomed beforehand to suffer much more than the left, and even to suffer to the profit of the latter." This can only be tested by the effect on the circulation. In cases of the beri-beri heart the pulmonary circulation goes on unimpaired, so that one may assume an efficiency of action and an absence of suffering as regards the right ventricle. On the other hand, congestion of the liver and large veins, with a feeble apex beat and a weak, rapid pulse, suggests that it is the left ventricle which is in difficulty. The teachings of clinical experience as given above may be right or may be wrong, but they do not seem to find much support in the clinical features of the beri-beri heart.

The great function of the right ventricle is to carry on the pulmonary circulation. In the beri-beri heart the weakened and dilated right heart develops incompetence of the tricuspid valve; Prof. Wenckebach says that "blood passes from the right heart backwards into the veins and liver, and the arterial output of the right ventricle is greatly reduced." Here we have the back-pressure theory in all its nakedness, but in spite of this failure of the right heart, "there is no lung stasis, no râles, and no pulmonary œdema." In short, this disabled and dilated right ventricle is carrying on its normal function most efficiently, and at the same time is doing extra work in pumping the blood back into the venæ cavæ and liver until they are gorged with blood. But this is not all the trouble of the right ventricle. "The right heart has to deal with the whole volume of blood returning from the periphery to the heart, *the left heart not receiving more blood than the right heart is able to transmit*. Consequently the right heart is all the time struggling for life against an ever-increasing overfilling and widening, but the left heart is spared a similar burden." But why this life and death struggle of the right heart? Is it so clear that it is the action of the right heart which has over-distended the venæ cavæ and liver? No action or inaction of the right ventricle can produce such stasis of the venæ cavæ and liver when at the same time an efficient pulmonary circulation is being carried on. One can conceive that the right heart may fail to carry on an efficient pulmonary circulation, with some reflux through the tricuspid valve, or that the right heart may carry on the pulmonary circulation efficiently without such reflux, but one cannot conceive that the right heart should be carrying on the pulmonary circulation leaders of the medical profession? In other words, what is there to prevent a highly respected and representative body of experts from issuing to the public carefully prepared information as to the early signs of cancer? One of the objections most commonly raised is that such an educational campaign would degenerate into scaremongering, and the result would be periodic outbreaks of cancerphobia and new crops of neurasthenics. But however carefully we examine the situation which would arise under such conditions, we cannot find more than two classes of persons concerned—those who are, and those who are not, suffering from early cancer. The first would surely benefit from advice which would lead them to an early medical examination. As for the remainder, they would, if alarmed, in most cases consult a doctor, and in due course be reassured. Another obstacle to an educational campaign is a deep-seated distaste on the part of many doctors to popularising medicine. To some it is a sacred cult, not to be prostituted by widespread publicity. The situation in the world of medicine to-day is curiously similar to the world of theology at the time when Wesley drew his followers from the dim religious light of churches to the secular atmosphere of the hillside. In defence of those who shun the popular health article or lecture as they would pornographic literature, we should remind ourselves that in the past a certain amount of popular health teaching has been undertaken by cranks and persons with some axe to grind. But this class has flourished largely because the field was left open to it by the more respectable members of the medical profession. It does not, however, follow that this field ought itself to be neglected. The presence in it of undesirables should rather be a spur to replacing them by something much better. The leaders of the medical profession who adopt a pose of masterly inactivity in this matter may find it interpreted (or misinterpreted) as a glaring example of timid indolence.

Yet another objection to an educational campaign about cancer is the lack of unanimity among the experts as to even the most elementary matters concerning cancer. They cannot tell the public whether it is infectious or not, hereditary or not. To one all-important question after another they are bound to admit ignorance. It is tempting in such circumstances to wait and see; peradventure the cause and uniformly successful treatment of cancer will be discovered shortly, and then it will be time enough to tell the public. To such arguments in favour of silence there is the unanswerable reply that, to repeat the opening words of this letter, practically everyone is agreed that the earlier cancer is detected, the better are the chances of recovery. And if every woman is taught that a swelling in the breast or an irregular hæmorrhage during the puerperium needs investigation at once by a doctor for fear of its being malignant, many who at present come to a doctor for the first time with an inoperable tumour would be saved. There can be no two opinions on this point. Reserve on the part of the medical profession in this matter may seem lofty and dignified to a few. To candid observers it must seem merely genteel.

I am, Sir, yours faithfully,

August 11th, 1928. D.P.H.

Death of Mr. T. B. Lapworth.—The death occurred on Thursday, August 9th, at the age of 59, of Mr. Trever B. Lapworth, who was for 44 years associated with the *British Medical Journal*, and for 17 years the head printer. He had been in failing health for some time, and will be sadly missed by numerous colleagues and friends.

An Improved Syringe for the Treatment of Varicose Veins.—We understand that the improved syringe which we noticed in our issue of May 19th, p. 1022, is now made in capacities of 3, 5, 10, and 20 c.cm., while its total length has been greatly reduced by increasing the diameter of the barrel and by using only one ampulla in the capillary tube instead of two as previously. The syringe can be obtained from Messrs. Adair, Dutt and Co., 47, Victoria-street, London, S.W.

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Medical Society of London.—The programme for the first half of the session 1928–29 has now been issued. On Monday, Oct. 8th, Dr. J. W. Carr will give a presidential address on Medical Ambitions and Ideals; on Oct. 22nd Dr. C. E. Lakin and Mr. Tudor Edwards will open a discussion on the Diagnosis and Treatment of Empyema; and on Nov. 12th Prof. Hey Groves and Dr. James Neal will open a discussion on the Medico-Legal Aspects of Fractures. On Nov. 26th there will be a clinical evening, and the last meeting of the year will be on Dec. 10th, when Dr. Wilfred Harris, Mr. P. J. Verrall, and Dr. James Brailsford will introduce the subject of Sacroiliac Pain. The Lettsomian Lectures will be delivered on Feb. 18th and 27th and March 6th by Dr. H. W. Barber, on Dermatology in Relation to other Branches of Medicine, and the Society's annual oration will be given on May 13th by Prof. Grey Turner, whose subject will be Cancer of the Colon.

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Royal Sussex County Hospital.—Dame Anne Beadsmore Smith, Matron-in-Chief of the Territorial Nursing Service, recently opened the two new wings which have been added to the nurses' home of this hospital. These extensions will bring the accommodation of the home up to 108 beds, and comprises rooms for the sisters and a large lecture room. A brief service of dedication was performed by Bishop Russell Wakefield, and prizes were presented to the nurses by Miss K. Scott, who has for 27 years been matron of the hospital.

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Stirling Royal Infirmary.—The new Royal Infirmary, which was opened by the Duke and Duchess of York on August 10th, has been erected on 15 acres of ground, being part of Wester Livilands estate, which is situated to the south-west of the town. The site is an ideal one from an infirmary point of view. It forms a great, open plateau, beautifully wooded, and commanding magnificent views of the surrounding country on all sides. The building is two storeys high, and contains four surgical wards of 16 beds each, two medical wards of 16 beds each, and one children's ward of 16 beds, with small side wards in addition. The administration department is placed in the centre of the building. There is also a maternity block, which contains two wards of eight beds each, with two single wards and one two-bed ward, accommodating in all 20 patients.

Centenary of Ancoats Hospital. — On August 11th, 1828, a new "public dispensary" was opened for the districts of Ancoats and Ardwick, which were then suburbs of Manchester. At that time and until about 40 years afterwards patients were treated at their own homes, while out-patients went to the dispensary for advice and medicines. There were then no arrangements for in-patients. In 1872 it was determined to add to the dispensary work "hospital practice," and in 1874 a new hospital with six beds was opened. In 1888 a new wing was added, which brought up the number of beds to 100, with developments in all branches of medical and surgical treatment. Situated as the hospital is in one of the most industrial and thickly populated districts of the city, it is now quite inadequate to the calls made on its services. An X ray department was opened in 1907 and a massage and electricity department in 1913. The board of management have determined to make the centenary celebration the occasion for an appeal for a building fund of £100,000. Land adjoining the hospital has been acquired and plans are ready for an extension with 100 additional beds, a new casualty department, extension of some existing departments, two new operating theatres, and the necessary accommodation for nurses and staff.

gives in his letter may be partly explained by the favourable climatic conditions under which he works and the exclusion of morphia from the routine.

We are, Sir, yours faithfully,
CHARLES R. BOLAND.
J. E. SHERET.

Ancoats Hospital, Manchester, August 8th, 1928.

THE VACCINATION COMMITTEE'S REPORT.

To the Editor of THE LANCET.

SIR,—The report, of which you gave the chief features in your issue of August 4th (p. 233), is a curious document in that its inside bears so little relation to the terms of reference on its outside. We seem to learn from it:—

1. That a certain amount of standardisation of vaccine has been done, but that the relation between any particular vaccinal dose and the immunity conferred by it is unknown.

2. It is recommended that a trial be made of vaccination by one insertion as is done in Canada, instead of by four marks as is at present the law here. Three such vaccinations per person are advocated, the first in infancy, then at school-age, and again between 14 and 16 years of age.

3. It is suggested that vaccination might be performed more aseptically in infant welfare centres than in some homes, and that public vaccinators should inspect their patients twice instead of once.

4. It is stated that vaccination may have some causal responsibility for the encephalitis which occurs ten days after vaccination.

5. Vaccination at epidemic and non-epidemic periods are not considered separately, save that it is assumed, no proof being given, that the revaccinated and those vaccinated in infancy do not contract post-vaccinal encephalitis, and that, therefore, all infants should be vaccinated in order that no person above that age should by primary vaccination run the risk of post-vaccinal encephalitis (a new reason for vaccination, to protect against vaccination).

6. It is stated that their recommendations involve no material change in the instructions to vaccinators under contract—that is, they do not desire any material change in the present methods.

7. It is an expensively printed report, singularly devoid of guidance to those responsible for small-pox and vaccination administration, and though it has taken two and a half years to produce, no attempt has been made to consider the problem from a practical standpoint or to envisage the present conditions.

8. From the reply of the Minister of Health to a Parliamentary question published on the recent bank holiday, it appears that post-vaccinal encephalitis is on the increase. It is therefore a mere question of time before the persons responsible for the vaccination of those children who die of post-vaccinal encephalitis will be considered by some as guilty of constructive murder.

9. Obviously the Committee appointed by the Ministry of Health and the Medical Research Council have regarded themselves as scientific tabulators of facts and have not considered it their function to criticise the department which appointed them. What is wanted now is what I suggested in your issue of Jan. 10th, 1925—namely, a real inquiry into small-pox and vaccination administration in all its bearings by a judge of the High Court; the gentlemen of the late committee should make excellent witnesses, for on the face of their documentary evidence, the sub-department of the Ministry of Health which deals with small-pox and vaccination requires a thorough investigation as to its methods. To cite one question, what is their justification for risking children's lives by vaccination as a protection against a disease which does not imperil their lives? They have, of course, a defence; it should be set out at an inquiry, and its value assessed.

10. The report of the Andrewes Committee of 1923, which only saw the light via the League of Nations about a year ago and is now published in full, should have given the authorities furiously to think. It has not done so, and it is time now that some one, trained to weigh evidence and come to conclusions thereon, should envisage the whole position. No one could better decide how this is to be done than the Lord Chancellor, in his present capacity of acting Prime Minister.

11. A year ago at Hastings I stated my views on the subject printed in No. 4 (1927) of the *Journal of the R.S.I.* The present report and recent happenings seem but to confirm them.

12. The root difficulty has always been that the orthodox regard vaccination as a panacea of universal application, whereas it should be regarded as an insurance proposition, vaccination being only the conferment of a temporary immunity from small-pox which may or may not be worth while under varying conditions. And this difficulty is aggravated by the antivaccinationists who claim that vaccination confers no protection—a manifest absurdity. Supporting their views by many easily refutable arguments they lead the orthodox to a reactive blind acceptance of certain very disputable conclusions.

I am, Sir, yours faithfully,
R. W. JAMESON.

West Wickham, Kent, August 14th, 1928.

EPHEDRINE.

To the Editor of THE LANCET.

SIR,—I have recently been treating several patients with low blood pressure by ephedrine hydrochloride (Burroughs Wellcome and Co.) in doses of gr. $\frac{1}{2}$. In the majority of cases the patients have complained of giddiness and feeling ill after this. These symptoms appear half to one hour after taking the ephedrine, and seem to last about two hours. I have found that gr. $\frac{1}{3}$ or $\frac{1}{4}$ seems to produce a very satisfactory rise in pressure and no toxic symptoms.

I am, Sir, yours faithfully,
H. W. HALES.

Sheringham, Norfolk, August 14th, 1928.

"FUSSING OVER CANCER."

To the Editor of THE LANCET.

SIR,—At the last session of the International Conference on Cancer, the president warned enthusiasts to beware of fussing over public health, or so, at least, it seems from your summary of this meeting (THE LANCET, July 28th, p. 182). Point was given to his admonition by a statement made by Dr. Stanley Reimann, of Philadelphia, to the effect that he could find no indication of the educational campaign of the last 15 years having had any effect. And yet, Sir, if there is one point in regard to cancer on which practically everyone is agreed, it is that the earlier cancer is detected, the better are the patient's chances of recovery. It might be inferred from this conclusion, so obviously true as really to be a truism, that cancer campaigns throughout the world would devote much of their energies and resources to shortening the interval between the first signs of the disease and the treatment thereof. Why, it may be asked, is there a certain hesitancy in pursuing this matter to its logical conclusion, and in launching educational campaigns with regard to cancer? There are two phases of the period which ends with the commencement of treatment. The first phase lasts from the appearance of the first signs of cancer to the first medical examination, usually made by a general practitioner. The second phase dates from this examination till expert treatment is instituted. For the sake of brevity, I limit myself to a consideration of the first phase.

What are the objections to a publicity campaign conducted anonymously in the lay press by the leaders of the medical profession? In other words, what is there to prevent a highly respected and representative body of experts from issuing to the public carefully prepared information as to the early signs of cancer? One of the objections most commonly raised is that such an educational campaign would degenerate into scaremongering, and the result would be periodic outbreaks of cancerphobia and new crops of neurasthenics. But however carefully we examine the situation which would arise under such conditions, we cannot find more than two classes of persons concerned—those who are, and those who are not, suffering from early cancer. The first would surely benefit from advice which would lead them to an early medical examination. As for the remainder, they would, if alarmed, in most cases consult a doctor, and in due course be reassured. Another obstacle to an educational campaign is a deep-seated distaste on the part of many doctors to popularising medicine. To some it is a sacred cult, not to be prostituted by widespread publicity. The situation in the world of medicine to-day is curiously similar to the world of theology at the time when Wesley drew his followers from the dim religious light of churches to the secular atmosphere of the hillside. In defence of those who shun the popular health article or lecture as they would pornographic literature, we should remind ourselves that in the past a certain amount of popular health teaching has been undertaken by cranks and persons with some axe to grind. But this class has flourished largely because the field was left open to it by the more respectable members of the medical profession. It does not, however, follow that this field ought itself to be neglected. The presence in it of undesirables should rather be a spur to replacing them by something much better. The leaders of the medical profession who adopt a pose of masterly inactivity in this matter may find it interpreted (or misinterpreted) as a glaring example of timid indolence.

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Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

Special two weeks Course in Infants' Diseases at the Infants Hospital, Vincent-square, Westminster.

SECOND WEEK.

MONDAY, August 20th.—2 to 3 P.M., Dr. W. E. Robinson: Chest Cases. 3 to 3.45 P.M., Miss Hughes (Matron of the Hospital): Lecture-Demonstration, Notes on Nursing Sick Infants. 4 to 5 P.M., Dr. Eric Pritchard: Lecture-Demonstration, Dried Milks and Patent Foods.

TUESDAY.—2 to 3.45 P.M., Dr. Eric Pritchard: Feeding Cases. 4 to 5 P.M., Mr. Philip Franklin: Lecture, Nasal Discharge and Sinusitis.

WEDNESDAY.—2 to 3 P.M., Miss Hughes: The Making-up of Feeds. 3 to 3.45 P.M., Dr. Eric Pritchard: Lecture-Demonstration, Infants' Stools. 4 to 5 P.M., Dr. C. C. Okell (at the Wellcome Physiological Research Laboratory, 25–28, Endsleigh-gardens, Gordon-square, W.C.): Diphtheria Prophylaxis.

THURSDAY.—2 to 3 P.M., Dr. Eric Pritchard: Feeding Cases. 3 to 3.45 P.M., Dr. Eric Pritchard: Lecture-Demonstration, Minor Ailments. 4 to 5 P.M., Mr. B. S. Simmonds: Lecture, Surgical Emergencies.

FRIDAY.—2 to 3.45 P.M., Dr. Eric Pritchard: Feeding Cases. 4 to 5 P.M., Dr. M. Maizels: Pathological Lecture, The Regulation of Hydrogen-ion Concentration.

SATURDAY.—2 P.M., Visit to Model Pasteurising Plant, Willesden, and to the Nursery Training School, Welgarth-road, Hampstead.

Appointments.

CROSSE, H., M.D., C.M. Edin., has been appointed a Medical Referee for the Districts of the Aylsham, Downham Market, East Dereham, Fakenham, Holt, King's Lynn, North Walsham, Norwich, Swaffham, Thetford, and Wymondham County Courts.

FACEY, R. VAUGHAN, M.B., Ch.B. Oxf., Medical Officer in charge V.D. Department, Royal Victoria and West Hants Hospital, Bournemouth.

MUSGRAVE, J. A., L.R.C.P.I., L.R.C.S.I., D.P.H., Medical Officer of Health for the County Louth.

Certifying Surgeons under the Factory and Workshop Acts: CONNOLLY, C. V., M.B., B.Ch. N.U.I. (Rothwell); and WALKER, F., M.B., Ch.B. Edin. (Falkland, Fife).

Vacancies.

For further information refer to the advertisement columns.

Aberystwyth, Aberystwyth Infirmary and Cardiganshire General Hospital.—H.S. £200.

Bath, Royal United Hospital.—H.P., H.S., and Asst. H.S. At rate of £120 and £100 respectively.

Bedford County Hospital.—H.S., also Asst. H.S. At rate of £175 and £130 respectively.

Birmingham, General Hospital.—Med. Reg. and Res. M.O. £155.

Blackburn and East Lancashire Royal Infirmary.—Res. H.P. Also Fourth H.S. £150 and £130 respectively.

Bradford, Municipal General Hospital (St. Luke's).—H.P.'s and H.S.'s. Each at rate of £200.

Bristol General Hospital.—H.P.'s, H.S.'s, &c. All at rate of £100.

Bristol Royal Infirmary.—H.P.'s, H.S.'s. Also Dental H.S. Each at rate of £80.

Cardiff, University College.—Lecturer and Demonstrator in Anatomy. £400.

Carmarthen, Joint Counties Mental Hospital.—Jun. Asst. M.O. £300.

Chiswick General Hospital, The Mall, Chiswick, W.—Hon. Surg. Also Asst. Hon. Anæsthetist.

Colchester, Severalls Mental Hospital.—Jun. Asst. M.O. £510.

Croydon County Borough.—Asst. M.O.H., &c. £600.

Dreadnought Hospital, Greenwich.—Surg. to Out-patients.

General Lying-in Hospital, York-road, Lambeth, S.E.—Res. M.O. At rate of £100.

Grove Park Hospital, Lee, S.E.—Sen. Asst. M.O. £650.

Hastings, Royal East Sussex Hospital.—Hon. Co-opted Dental Surgeon.

Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—H.P. At rate of £110.

[illegible] Borough of—M.O.H. and School M.O. £800.

[illegible] *rrey County Sanatorium, Milford, near* [illegible] sst. Res. M.O. £500.

Le[illegible] *Committee.*—Asst. School M.O. £600.

Leicester Royal Infirmary.—Res. M.O.'s. Each at rate of £125.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Manchester, Hulme Dispensary, Dale-street.—Res. M.O. £

Manchester, Park Hospital, Davyhulme.—Three R.M.O.'s. One at rate of £150 and two at rate of £120.

Market Drayton, Salop, Cheshire Joint Sanatorium.—Asst. M.O. £250.

Newport, Mon., Cefn Mably Hospital, Michaelstone-y-vedw.—Asst. Res. M.O. £200. Also Third Asst. Res. M.O. at South Wales Sanatorium, Talgarth, near Brecon. £2[illegible]

Norwich, Norfolk and Norwich Hospital.—Hon. Asst. Phys.

Nottingham City.—M.O.H. £1440.

Nottingham City Mental Hospital.—Jun. Asst. M.O. £350.

Plymouth, Homœopathic and General Hospital.—H.S. At rate of £100.

Plymouth, South Devon and East Cornwall Hospital.—H.S. At rate of £50.

Rotherham, Rotherham Hospital.—H.P. £180.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.

Southampton Parish Infirmary, Shirley Warren.—Second Asst. Res. M.O. £275.

Swansea General and Eye Hospital.—Sen. Res. O. £250.

Wandsworth Borough Council.—Locum Tenens, Asst. M.O.H., &c. £10 10s. weekly.

West London Hospital, Hammersmith-road, W.—Non-Res. Cas. O. £5 5s. per week. Also H.P. and two H.S.'s. Each at rate of £100.

Western Australia Lunacy Dept.—Jun. Asst. Res. M.O. £456.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Eastbourne, Sussex; and at Wendron, Cornwall.

Births, Marriages, and Deaths.

BIRTHS.

CARSON.—On August 2nd, the wife of Dr. Hugh Carson, the Hospital, Selly Oak, Birmingham, of a daughter.

GILES.—On August 9th, at York House, Stourport, Worcs., the wife of Dr. O. Pemberton Giles, of a son.

MATHEWSON.—On July 31st, the wife of Dr. W. R. Mathewson, Netherhill, Aberdour, of a daughter.

ROBB.—On August 12th, at Lodge Farm, Melton, Suffolk, the wife of Captain Campbell Robb, R.A.M.C. (retd.), of a son.

RUSSELL.—On August 4th, at Tooting Bec-gardens, Streatham, S.W., the wife of Dr. C. M. Russell, of a son.

TIVY.—On August 7th, the wife of Dr. Eric Tivy, of North Woolwich-road, Silvertown, of a daughter.

TODD.—On August 10th, at Cuckfield, Sussex, the wife of H. C. Todd, F.R.C.S., of a daughter.

WHITEHEAD.—On August 4th, at York Mansions, S.W., the wife of Major N. T. Whitehead, R.A.M.C., of a daughter (stillborn).

MARRIAGES.

ARNOTT—HOWDEN.—At St. Columba's Church, Crieff, Perthshire, *on August 8th, by the Rev. N. J. N. Gourlie,* M.A., Maurice James, only son of Dr. and Mrs. James Arnott, of Brampton, Cumberland, to Jean Skeffington, elder daughter of Emeritus Professor and Mrs. Robert Howden, of Broomfield, Crieff (formerly of Newcastle-upon-Tyne).

CAPELL—DREW.—On August 11th, at St. Mary Abbots, Kensington, Dr. L. F. Capell, of Cricklewood-lane, N.W., to Dorothy Edith, only daughter of the late William Godson Drew, of Hove, Sussex.

LORRAINE—WILSON.—On August 9th, at St. Mary's Parish Church, Knebworth, J. C. Lorraine, M.D., F.R.C.S. Edin., of Montpelier-square, S.W., to Alicia Hill, daughter of Mr. and Mrs. Wm. Wilson, of Knebworth.

SELLORS—LYELL.—On August 8th, at St. Jude's Church, Kensington, Thomas Holmes Sellors, B.M., B.Ch., M.A., to Brenda Murray, daughter of Mrs. W. D. Lyell, Courtfield-gardens, S.W.

THOMAS—NEWCOME.—On July 31st, at St. Gabriel's Church, Warwick-square, London, Ellis Rae Thomas, M.D., M.R.C.S., L.R.C.P., to Lilian Gladys, fourth daughter of the late Chester Pern Newcome, of Long Clawson, Leicestershire.

DEATHS.

CAMBRIDGE.—On August 12th, at Crouch Hill, Thomas Arthur Cambridge, M.R.C.S., L.S.A., aged 82.

CHILDS.—On August 6th, at Rock House, West Looe, Cornwall, Christopher Childs, M.D., aged 81.

DAVIDSON.—On August 11th, at Over Frays, Uxbridge, John Davidson, M.B., aged 70.

EASTES.—On August 8th, at Manor-road, Folkestone, Thomas Eastes, M.D., aged 78.

GREY.—On August 10th, at Harrold, Bedfordshire, suddenly, from pneumonia, Egerton Charles Grey, M.A. Camb., D.Sc. Lond., M.R.C.S., L.R.C.P., F.I.C., late of Cairo.

KERSWILL.—On August 10th, at Sackville House, Sandwich, Harry Kerswill, M.R.C.S., L.R.C.P., aged 60.

OAKDEN.—On August 12th, William Marshall Oakden, B.A., M.B., B.Chir. Camb., F.R.C.S. Eng., Medical Superintendent of St. Luke's Hospital, Lowestoft, aged 41.

TUXFORD.—On August 8th, at Wide Bargate, Boston, Arthur Tuxford, J.P., M.D., aged 87.

WHERRY.—On August 12th, at Cambridge, George Edward Wherry, F.R.C.S., aged 76.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

NOTES ON THE SLACK ABDOMINAL WALL.

BY LIEUT.-COLONEL J. K. MCCONNEL, D.S.O., M.C.,

MEMBER OF THE CHARTERED SOCIETY OF MASSAGE AND MEDICAL GYMNASTICS.

THE following aims at placing the treatment of this condition on to a scientific basis; it is hoped thus to avoid the criticism in Allbutt and Rolleston's "A System of Medicine": "The treatment ceases and, when a sufficient time has elapsed to undo the good which has been done, the patient becomes as bad as ever." The writer asks forgiveness for the extensive quotations in the following lines, but he feels it important to base his arguments on sound authority.

When one investigates this subject, one is in danger of becoming bogged in the voluminous literature that discusses ptosis of the abdominal contents—either severally or collectively. A direct attack on the viscera themselves has not led to very gratifying results and, as is stated in "Modern Medicine" (Osler and McCrae): "The treatment is in the main rather unsatisfactory. . . ."

In order to concentrate our attention on the musculature of the weak abdominal wall, let us take as a simile a motor tyre in which a bulge has appeared. Supposing one finds no replacement at the nearest garage, one may instruct the mechanic to insert a sleeve between the two tubes. In these circumstances no one would blame the air inside for having caused the distressing symptoms, but one would do one's best to overcome the defect in the outer cover and render it an adequate support for its contents.

In the same way several authorities have noted the disappearance of symptoms of visceroptosis, when a suitable support has been applied. Prof. Starling stated: "These viscera in the normal condition are pressed against the under surface of the diaphragm by the elasticity of the abdominal wall." Sir Arthur Keith[1] states: "Now, as is well known, when a living subject raises his body to the sitting or standing posture, the upper viscera do not drop more than ½ or ¾ in.; the ligaments and mesenteries can therefore take no part in sustaining the viscera. The supporting structures are the muscles of the belly wall; particularly is the transversalis muscle important in this respect; it is a living belt which girds the loins."

Let us now leave the viscera and turn our attention to the abdominal wall.

Muscle Action.

Before pursuing the argument it seems advantageous to summarise certain characteristics of muscles. Prof. Starling, in his "*Principles of Human Physiology*," wrote as regards muscular tone: "Every muscle in the body is in a condition of slightly continued contraction which keeps it tense, so that when it contracts in response to a stimulus, there is, so to speak, no "slack" to be taken up before the muscle begins to pull on its attachments. . . . The tone of the muscles is a reflex phenomenon and is dependent on the integrity of the reflex arc governing the muscles in question. It has been shown by Sherrington that the afferent part of the arc is represented by the afferent nerves from the muscle itself. . . . To this system of afferent nerves Sherrington has given the name of the proprioceptive system, since it is excited, not directly by changes in the environment, but by alteration in the animal itself."

A muscle may act in four ways. It may remain at rest, may contract, may "hold," or may relax. Patients sometimes think that muscles can push; at least, they explain movements in terms that would necessitate this. Contraction may take place actively, as when causing a movement, or as a passive shortening, when the energy required for a movement is supplied by some outside force—e.g., gravity—another person, a spring, &c. During an active contraction energy produced by a muscle is impressed on the system to which it belongs through the medium of its attachments or else hydrostatically. As an example of the latter we may take: "The contractions of the skeletal muscles squeeze the veins contained within them, and drive the blood on towards the heart."[2]

Following the classification of muscles in a normal act[3] as given by Dr. Kinnier Wilson, we find:—

1. *Prime movers, or agonists*, which initiate the act.
2. *The antagonists*, which would tend to interfere with the above movement, if they were not reciprocally inhibited.
3. *Synergic muscles* (synergists), which neutralise undesired actions, as when a prime mover, by passing over two or more joints, might give two or more actions, one being desired.
4. *Fixation muscles* (fixers), which provide firm origins from which the others may act.

In a firm closure of the fist the agonists are the flexors of the thumb and fingers, and antagonists are the extensors of the same; as synergists we find the extensors of the wrist, and as fixers the flexors and extensors of the elbow and many other muscles as well. Movements of coöperation also take place;[2] of these one may mention arm-swinging in walking.

The Abdominal Wall as a Muscle.

Turning now to the behaviour of the abdominal wall as muscle, we find its activities intimately related to other groups of muscles. We see a "great cylinder" (Keith), the sides of which are formed by the erector spinæ, quadratus lumborum, and the abdominal wall, while the top and bottom are imperfectly closed by the diaphragm and the pelvic floor. Sir Arthur Keith states: "We are apt to forget that the chief muscles of the belly wall, the two recti, the external obliques, and the internal obliques are primarily muscles of the spine; they are powerful postural antagonists of the component elements of the erector spinæ muscles. . . . The student is so apt to concentrate his attention on the respiratory action of the ribs that he forgets that they are the most powerful of the spinal levers. All the muscles attached to the ribs—the intercostals, the rectus abdominis, and oblique muscles of the belly wall—are prime movers and balancers of the spine."[1]

The abdominal wall, being antagonistic to the diaphragm, acts as a respiratory muscle; it contracts during expiration, forcing the latter up, the energy being transmitted hydrostatically. Prof. Starling wrote: "In fact, Sherrington's results on the coördination of muscular movements would tend to make us assume inhibition of the tone—e.g., of the abdominal muscles, during inspiration, and active augmentation of tone during expiration. Where the tone of the muscle is entirely lost—e.g., in the condition of visceroptosis—it has been observed that the diaphragm is thrown out of action, breathing being chiefly carried out by an elevation of the upper part of the thorax."

We must now refer to the action of the abdominal wall in a movement which may be termed "flattening out the lumbar curve," as it will be made use of during treatment. It can take place in any position, but one should realise that, unless the lumbar erector spinæ relax reciprocally, it cannot occur. During this movement the abdominal wall is normally the prime mover, but in certain positions, such as lying supine or reclining in a chair, gravity assists and, in fact, may supply the entire energy requisite for the movement, while the abdominal wall merely shortens passively. Under some conditions the movement is assisted by contraction of gluteus maximus and the hamstrings. When the action of these muscles becomes of importance, it will be seen that the movement approximates to a rotation of the pelvis, and that this rotation would, for instance, in the standing position, take place about an axis drawn through the hip-joints, whereas in other positions a variation from this axis would occur. For practical purposes this rotation, which is an important factor in treatment, may be described as "turning the tail between the legs," and it is interesting to notice the coöperation between the abdominal wall on the one hand and the gluteus maximus and hamstrings on the other. The rotation may be readily perceived by laying the hand on the sacrum, though not, however, on gluteus maximus, if this latter is strongly developed.

One further point before passing on: Should a patient maintain a contraction of the erector spinæ, make a contraction of the abdominal wall and, at the same time, hold his breath, one then observes that his chest is forced up. This combination of muscle actions frequently occurs when a patient tries to flex or to flatten the lumbar spine.

Tone.

As regards the tone of the abdominal wall, Sir Arthur Keith[1] states: "The moment we assume a sitting or a standing posture there is set going a reflex mechanism which throws the muscles of the belly wall into a state of postural tone." This, of course, refers to the normal individual who has a satisfactory abdominal wall. From earlier quotations we see that this tone depends primarily on proprioceptive impulses from the constituent muscles themselves, and should note that the alternate inhibitions and augmentations of tone reciprocally in relation to the diaphragm tend to keep the abdominal wall in a healthy state.

In one type of individual we find a slack abdominal wall associated with a marked lordosis or increase of the lumbar curve. As regards the obese variety of this type, there is, in Dr. W. F. Christie's "Surplus Fat and How to Reduce it," a clever sketch entitled, "Election Day at the Fat Man's Club." The next gentleman to enter in is depicted sideways on, displaying a magnificent "object in view," as a large tummy is sometimes called, and one notices a strongly developed lordosis. It has been found that a proportion of this type, both the obese and the thin varieties, suffer pain in the lumbar region, and often it is for this reason that they submit themselves for treatment. This pain may arise in the joints—vertebral or sacro-iliac—or else in the muscles and surrounding structures; if in the latter, it is due to the presence of waste products, to strain or to spasm required for the fixation of painful joints, and in any case a lack of coördination of the constituents of the muscle group is likely to be a factor of some importance.

Anyone who wishes to appreciate the condition of this type of patient should clasp with both arms a heavy weight, holding it about the level of the umbilicus, and walk upstairs. Balance is preserved by canting the upper part of the body backwards, maintaining this attitude by a contraction of the lumbar muscles. After mounting several flights of stairs in this way a pain in the back may become quite noticeable. When a group of muscles finds itself antagonistic to another strong group held in contraction, its tone tends to be inhibited. Such an inhibition of tone tends to be forced on the abdominal wall whenever the lumbar muscles are held in spasm. It will thus be realised that normal activity of the abdominal wall in relation to the diaphragm tends to improve the tone of the abdominal wall, whereas spasticity of the lumbar muscles tends to depress it.

Another type of individual has a thin and sagging abdominal wall, but without any undue lumbar curvature or, in fact, with a deficiency thereof. As a rule, the cervical curve is exaggerated (ewe-neck) in order to assist in giving a horizontal line of vision, the tilt of the eyes, the relation of occiput to atlas, and the dorsal curve being variables in this respect. As will be shown later, the proprioceptive messages from the prevertebral cervical muscles are an important factor in the tone of the abdominal wall. In this type of patient the abnormal balance between the post and prevertebral cervical muscles is the key to the situation.

We must refer briefly to alterations of tone of the abdominal wall due to impulses which arise in the afferent nerve-endings of the viscera. On the one hand, rigidity of the former is a well-recognised symptom of acute conditions in the latter, while on the other hand Sir C. Sherrington demonstrated that when the afferent nerves from the viscera are severed, the abdominal musculature loses its postural tone.

Posture.

"In the maintenance and recovery of posture many separate types of reflex converge to produce a common result, and these reflexes arise from such sense organs as the labryinth, the eyes, and the muscles themselves. The removal of the central hemispheres has but little effect on normal posture or on righting reactions by which that posture is resumed after having been interfered with. It is clear, therefore, that these reactions are true reflexes, and it would be quite wrong to imagine that the animal knows that its posture is being upset, resents interference, and voluntarily acts in such a manner as to counteract the offence." [4]

"Consciously, we are in complete ignorance of the specific muscular units effecting a 'voluntary' movement. . . . The point at present is that a very large part of every 'voluntary' movement is both 'involuntary' and outside consciousness." [3]

Prof. Magnus's researches have classified these reflexes in terms of the organs from which the stimuli arise, also as to whether they refer to movement (stato-kinetic) or rest (static), both as regards "pose" or "righting." "In general we can say that by means of the stato-kinetic reflexes the body is brought into its normal pose, which pose is maintained by the operation of the various static reflexes. It will have been noticed that the head plays an important part in deciding most of these responses. The head contains the organs of special sense, particularly the distance receptors for sight and sound, so that the head tends to be voluntarily directed towards stimuli which affect these sense organs. The proper orientation of the remainder of the body which ensues is effected by the action of the various reflexes which have been described." [4] Dealing with the same subject, Prof. Starling wrote: "In the evolution of the nervous system there has been a continual subordination of the hinder parts to the head end, in consequence of the development at this end of the all-important *distance receptors*, the impulses from which take a predominating part in determining the reactions of the body as a whole."

Dr. Kinnier Wilson's example of muscle action, when firmly closing the fist, may be amplified. If it took place in a standing or sitting position, the muscle action of the trunk, coördinated to maintain posture, would be synergic and also would fail to obtrude into the field of consciousness. The man would not notice the pose of his body, which would be taken up in accordance with his normal habit.

Sir Arthur Keith [1] points out that the spine of the human baby changes from the primitive curve in the second year of life, and adopts the lumbar curve. This alteration takes place through the medium of the spinal muscles—the spine's balancers. We must not consider this lumbar curve as fixed, but rather as varying continuously to suit the requirements of the moment. The same applies, and even more so, to the relative tension of the balancing muscles. One might argue that, while this curve is being established, consciousness takes it into account, but certainly later it passes unnoticed, unless commented on by a parent. The child is consciously concerned with his hand movements, &c., and only gross mis-balances of the lumbar and abdominal muscles are recognised. We thus see that it is possible for an undue contraction of the lumbar muscles to arise in early youth and develop, so to speak, along with the child; this contraction would merely be a failure to adapt the body to its environment. The so-called "pot-bellied" type of child constitutes a more serious condition than the above; the disturbance in this case is probably visceral in origin.

As a rule, it is probable that a lumbar spasm, as we now can term it, arises as a secondary condition to a mal-posture of the shoulders and dorsal region. The child gets tired either when standing or sitting; the shoulders droop and the dorsal region becomes round. The parent or teacher, thinking of the contracted chest, says "sit up," directing the child's attention to its head and also, perhaps, to its shoulders. As the levator anguli scapulæ rhomboid-serratus magnus sheet of muscle, as well as the dorsal muscles, are tired, the child compensates in the easiest possible manner, namely, by contracting the lumbar muscles and, by inducing a lumbar curve, makes the dorsal curve less apparent and the cervical lordosis (ewe-neck) less pronounced—" . . . sitting bolt-upright is particularly exhausting, especially for young people . . ." (Keith.)

When dealing with patients who have a slack abdominal wall, it is usually noticeable that, in the erect position, attempts to flatten the shoulders or decrease a dorsal curve are not limited to the correct muscles, but irradiate downwards to the lumbar area, or sometimes upwards to the cervical region. Before treatment they are virtually unable to contract alone the dorsal muscles; this is so even after the movements concerned have been performed passively to ensure they realise what is required.

Brief reference must be made to conditions that may arise subsequent to pregnancy; treatment is discussed in "A Textbook of the Practice of Medicine" (F. W. Price). It appears that the lumbar spasm—accompanied by pains in the back—which is so often a feature of the last few months of pregnancy, occurs in the effort of preserving balance when walking or standing. In some cases this postural habit persists after childbirth, although the stimulus which gave rise to it is no longer present; such conditions as tender sacro-iliac joints, if inadequately supported, would encourage this persistence. It is suggested that this lumbar spasm militates against and tends to delay the recovery of the stretched abdominal wall, the proprioceptive impulses from the former tending to reduce the tone of the latter.

Proprioceptive impulses from the neck muscles have already been mentioned as a stimulus which increases the tone in the abdominal wall. Prof. Magnus's cinematograph films of *falling cats*, which showed the head righting first, and then the body, indicate a chain reflex compounded from a labyrinthine reflex as regards the head and a neck reflex as regards the body. When *teaching* a horse a correct "reining back"—the forefeet moving first, so as to arch the spine and necessitating a full contraction of the abdominal wall—one notices the extreme importance of a correct muscle balance in the neck. When teaching patients a good neck posture they frequently, on their own initiative, draw attention to the increased tone in the abdominal wall, which accompanies their newly-acquired neck movement. This can be demonstrated both when lying and when erect; it is certainly not merely a transient stretch reflex. Unfortunately, little research seems to have been done on this point, but it *appears* certain that the neck reflex which *accompanies* a good neck carriage is an important factor in human posture.

Sir Arthur Keith draws attention to the difference between a power of voluntary contraction and a condition of postural tone. An abdominal wall may be excellent when voluntarily contracted, and yet a few minutes later, when the patient's *attention has* been directed to something else, it may revert to "C3" as regards postural tone. We can state the conclusion that a posturally slack abdominal wall is associated with either an undue lumbar spasm or a deficient tone in the prevertebral neck muscles, or with both. Healthy exercise in relation to the diaphragm helps to maintain the *abdominal wall in good condition* and delay its degeneration. Teaching relaxation of the antagonist is *the first principle* of re-education as laid down by Dr. J. B. Mennell; [5] it is undoubtedly the first step in a rational treatment of a slack abdominal wall.

Reflexes.

We find ourselves faced with a problem of postural reflexes and, in order to follow the subject to its logical conclusion, we must invoke the aid of Prof. Pavlov's researches, from which we can obtain valuable assistance. It is not easy to recognise at first sight exactly with what we are dealing; for instance, the supposed inborn reflex which Pavlov extensively employed—namely, the "salivation of animals on sight and smell of meat—is not an inborn or unconditional reflex, but an acquired one.";[4] it is probable that it is predisposition to such a reflex which is transmitted by heredity. Are we dealing with an inborn reflex *in the case of the* lumbar muscle tensions or in the case of belly wall (see previous quotation from Keith)? If so, to what extent are they inherited, and how much conditioned by the experience of the individual?

In point of fact Pavlov himself inhibited an inborn reflex by means of another one, as he records in his work "Conditioned Reflexes." As Prof. Starling stated: "It is however possible to extinguish artificially a (conditioned) reflex in the course of a few minutes. Such an experimental extinction of conditioned reflexes can be obtained by arranging the conditions of the experiment, so as to break the first law of conditioned reflexes, namely to use the conditioned stimulus several times in succession without combining it with the unconditioned stimulus." Thus the deleterious effects of either type of reflex can be got over when desirable, but we must beware of inhibiting inhibitions which we are trying to establish.

Let us take it that, at the present stage of the development of our race, the muscular contractions inducing those compensatory spinal curves which are designed to keep the head level, &c., in the most satisfactory manner, are an inherited reflex. Groups of stimuli from the labyrinth, neck, &c., that arise on the assumption of the erect position, act in relation to the above. In the normal human being the erect position evokes an *increased tone in the belly wall* (Keith). We must remember that from the assumption of the erect position there does not result just a single stimulus but a group of stimuli, some or other of which may predominate in each individual. Pavlov found that such factors as old age, pregnancy, distension of the bowels, ill-health including digestive troubles, drugs such as caffeins, bromides, alcohol, &c., altered the relative intensity of excitation and inhibition. Under these *conditions it is* simple to imagine how the normal reflex in relation to the erect-position group of stimuli becomes inhibited and at first some, then more, of these stimuli come to "condition" the increased tone of the lumbar muscles and to have a reciprocal effect on the abdominal wall, as already described.

Treatment.

The outline of treatment consists of dissociating the postural stimuli from the patient's undesirable postural motor reactions, and then linking them up with those that are more satisfactory. The patient practises on the one hand. the required muscle actions—individually or in groups—in positions in which the postural stimuli of the erect position either do not operate or are naturally inhibited. On the other hand, the same postural stimuli are allowed to act under temporal or spatial conditions, in which they do not call forth his undesirable reactions. Thirdly, the patient is shown how to encourage the linkage of stimuli with a satisfactory posture. Besides this he must appreciate from the outset how to avoid undoing the results of his efforts during the intervening periods, until the new postures become automatic when conscious effort is no longer required.

The use of stretching exercises to deal with spasticity *in the* lumbar region would not appear to produce the best results. As a rule, forcible stretching *is* not required and if it were, the patient's condition would probably lead to it being contra-*indicated*. It is far wiser to teach a relaxation and trust that such stretching as is necessary will come with improved function.

Following the lead of Pavlov's work, we see the importance of the "erect position" being really a group of conditioned stimuli instead of being a single one. A man who has just learnt to relax his lumbar muscles when sitting *in* a certain chair may not be able to repeat this under slightly different conditions—e.g., in a chair with a lower seat or back at a different slope. He certainly cannot repeat the relaxation at once when standing; *this is* important, because patients are inclined to try and estimate progress when standing up at the termination of a treatment. Pavlov shows that with dogs, stimuli from other parts of the brain effect conditioned reflexes both as regards synthesis and inhibition—with human beings this must occur to a still greater extent—thus the memory of failure or success in a movement or exercise may make a vast difference to results. In this postural work one finds that what suits one patient is virtually useless with another, although the conditions appear to be almost identical.

From the foregoing one can guess that exercises in the erect position should be given with caution at first. In "sitting" one can use from the outset certain relaxation postures and exercises, but in "standing" anything of the kind is contra-indicated, as it would tend to inhibit the inhibition we are developing. Certain uncommon positions are of extreme value, as for instance, "hands and knees"; provided the heart, &c., permit, there appears no objection to the assumption of this position, as patients over 70 years old, and others over 20 stone, have taken to it eagerly. These uncommon positions have an advantage of being a virgin field as regards stimuli; in them the stimuli have never been wrongly connected and so do not require to be inhibited. Lying positions are of the greatest importance, as is so strongly advocated by Dr. Joel E. Goldthwait.

One must say, however, that it is essential to connect what is learnt in the above positions with what one wishes to take place in "standing" or "sitting." This can be done either by a steady transition from one position to another, or by the patient grasping a similarity of joint movements, muscle actions, &c., noting the varied effect of gravity on the different parts of his body. Another useful method is to arrange that the contractions of the postural muscles are synergic to other muscles, whose activity is for the moment vividly within the field of consciousness. Synergism is thus used as a stepping-stone between voluntary effort and normal postural activity. Incidentally, in this way, a patient is led on from the idea of a correct posture, when his body is at rest, to one when he is in motion.

As Prof. Starling wrote: "The shorter the intervals between the successive presentations of the conditioned stimulus the quicker the extinction." This, of course, applies equally to the re-synthesis. "A conditioned reflex which has undergone such extinction, however, regenerates spontaneously after a few hours. . . . Repeated extinction has much more profound effect, and the spontaneous regeneration of such reflexes is progressively slower and less complete so that after having undergone several extinctions, the reflex disappears altogether."[4] Tri-weekly, or even daily, treatment in gymnasiums where patients undertake complicated exercises, difficult to repeat except under the eye or with the help of a gymnast, do not appear likely to give the optimum results. To obtain these, it seems best to visit the patient and work in his own study and/or bedroom, so as to show him exactly how to use his own chair, sofa, &c., to the best advantage. "Little and often," as Dr. J. B. Mennell points out, should be the rule; practice at decreasing intervals soon makes a posture automatic and re-establishes a good habit. One must show the patient movements and relaxation postures applicable to various occasions, those for before rising and after retiring, those for use when turning over a leaf of his paper, when strap-hanging in the tube, sitting in the car or bus, when "dummy" at bridge—no one would notice that a curative process was in progress, so there would be *no* cause for comment or laughter.

Reference has been made to relaxation postures. These are most important. As examples, one may cite: sit with one's feet on a footstool so as to avoid an undue lumbar curve; have a pillow under the knees if taking breakfast in bed; lie on one's side with the knees drawn up, especially if this is associated with "turning the tail between the legs." This tilting of the pelvis is of course one of the most valuable movements. Many patients are unable at first to contract gluteus maximus or the hamstrings to assist in the movement. In this case contraction of the specific muscle is best learnt alone—for example, when reclining against pillows in bed, straighten out the hip-joint and slide down in bed. No one, unless paralysed, &c., could fail to do this simple *movement*, and the required contraction, after having been felt, can be performed in other *positions* and in combination with that of other muscle groups.

Looking glasses are useful during treatment, as ocular demonstration has a great power of suggestion. The usual three-quarter length wall-glass and a hand, or *other* portable, mirror will suffice; they are especially valuable when teaching neck postures. Shadow*graphs* and a blackboard *have* been advocated for postural instruction.[5]

The number of *treatments* required depends largely on the voluntary control the patient has over his various muscles. An incoördinate *patient* who has never been accustomed to games of skill will take longer, especially if he has extreme weakness of the abdominal wall and spasticity in the *lumbar* region, than one who has to some degree trained for sport or athletics. Additional disturbances, such as round shoulders, a contracted chest, *especially* in elderly people, increase the difficulty of obtaining a satisfactory result and, consequently, the length of treatment. Sometimes *it* is found that even a couple of treatments suffice to put a man on the *right* road so that he can continue to develop good habits by himself. It is taken for granted that during a treatment of the nature described in these notes, the medical practitioner in charge of the case will prescribe such medicinal or other treatment as he deems advisable. One must add, in conclusion, that the feeling of well-being that comes from an improvement in portal circulation and greater activity of the abdominal wall is sufficient incentive for a patient to continue the slight amount of effort that is needed.

I am permitted by Sir Arthur Keith to say that, in his opinion, facts are brought to light in this communication which would be useful in practical therapeutics, and which, while well known to workers along the special line, are not necessarily equally well known to practitioners. This has encouraged me to publish the notes.

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NAVAL TRAINING ASHORE.

THE good training ship, H.M.S. *St. Vincent* (Portsmouth), seems like Antæus to have gained fresh vitality since it touched mother earth and took over the old Marine Barracks at Gosport. Surgeon-Commander H. W. Nicholls tells in the *Journal of the Royal Naval Medical Service* for July of the comfort and care which surround these bluejacket boys, of whom there are at present about 600. During a nine months' stay a boy adds on the average 8 or 9 lb. to his weight and 2 to 3 inches to his height. The boys are housed in four blocks, with a separate building for new entries. Heating is by radiators throughout; in winter dormitories are warmed up from 2 A.M. until the boys have finished dressing and fires are lighted early in the school rooms for the work which is done there before breakfast, Commander Nicholls believing these early hours to be the danger period. Special attention is given to providing green vegetables which he finds discourage boils. The routine baths are hot and cold showers, and are fully used, voluntarily, too, after games. Physical training, in which games play a large part, produces remarkable results; the boys take quickly to hockey and Rugby football, but some prefer reading, and there is no compulsion. There is a covered swimming bath. Among new entries there were seven cases of mumps, four of scarlet fever, in nine months; apparently none among "old boys." There are 26 beds in the sick bay; work in the ship is strenuous, and the common form of "going sick" is a tiredness which is slept off in 24 hours, duty being resumed in 48. Recruits are coming in more from Gosport now, where parents see how well off the boys are. The medical officer notes with admiration their ability to eat a two-course dinner in seven minutes, without ever a complaint of indigestion. It is pleasant to know that another wooden training ship, with its risk of infection from confined space, has been disestablished. Ut exeant omnes!

IS THERE A NEUROTROPIC SPIROCHÆTE?

MANY of the reports on acquired syphilis in family groups emphasise the frequency of neurological complications, and invoke the influence of a so-called neurotropic strain of *Spirochæta pallida*. H. Noguchi and other workers distinguished this strain from the "dermatropic" by its size and variations in its incubation characteristics in experimental animals, as well as by its results. There is a school of thought which holds that infection from a common source tends to produce the same type of syphilis in all who catch it. A number of investigators, however, believe that the soil is more important than the parasite in determining the form of the manifestation. The former produce evidence of the disease, taking the same form in husband and wife; J. E. Moore and A. Keidel studied 111 married couples and found that in 57 per cent. of the cases with parenchymatous neurosyphilis the partner also had neurosyphilis in some form. A similar experiment at the Mayo Clinic, however, only yielded 22 per cent. of positive results.

In order to see what evidence could be produced on the other side, that of the predominance of family characteristics, Dr. P. A. O'Leary and Dr. M. W. Rubenstein have investigated[1] 13 families whose members had acquired syphilis from different sources. They eliminated patients with any signs of congenital syphilis or parental history before the birth of children, and exacted clinical and serological evidence of syphilis, and a history of chancre followed by secondary signs. There were four groups of sisters, two of brothers, two of brother and sister, two of mother and son, two of mother and daughter, one of father and son, and one of mother, son, and daughter. In seven families more than one member, in two neither member, and in four families one member only had neurosyphilis.

Although these observers agree that trauma, disease, virulence of the organism, and the type of treatment are important factors, they see in their results evidence for the greater importance of the family characteristics. The results of treatment gave a more striking indication of the working of this factor, for in five out of the seven families with neurosyphilis all the members responded favourably, while in the other two none responded. The conclusion seems to be a sensible one, but the smallness of the number investigated throws doubt on the evidential value of the experiment.

NEW PREPARATIONS.

Eukodal.—This analgesic preparation, supplied by H. R. Napp, Ltd., 3 and 4, Clements Inn, Kingsway, London, is introduced as an ideal substitute for morphine. Codein is not held to be dangerous as an addiction drug, and has been excluded from the Dangerous Drug Act. The formula is given as dihydroxy-codeinon hydrochloride, and it is claimed both to be an excellent substitute for morphine and of great value when used in conjunction with morphine. The narcotic and analgesic effects are produced when the drug is administered orally, where its employment is specially recommended for allaying irritative cough, while to meet cases of pain subcutaneous injections may be employed.

The same firm sends us a new theobromine preparation, *Theosol*, whose full formula is theobromine calcium salicylate, a formula which explains the intentions which have led to the preparation of the drug. The indications for its use are probably familiar to many of our readers; this combination has been recognised of value in arterio-sclerosis and asthma of the cardiac form, and is also found to possess diuretic qualities.

LONGEVITY.

THE *Times*, on August 13th, devoted a leading article to Mr. Li Ching Yun, who is alleged just to have celebrated his 250th birthday, the representative of the *North China Herald* having visited him and found him quite well. His name is at any rate worth putting on record, as Thomas Parr with his 153 years is put completely in the shade. Some people are doubtful of Parr's credentials, but in December, 1926, the death was reported at Constantinople of Zaro Agha at the age of 153, and mention was made then of Teku Oglu Ali Agha, aged 147. In November of that year, also, the death was reported, at the age of 135, of Maria Ustav, in Carcaliu, Tulcea, Dobruja, Roumania, who lived on vegetables and fish and was a strict teetotaller, but no doubt consumed the soured milk of the country to which the number of centenarians in Bulgaria and Roumania is largely attributed. It is presumed, of course, that the Chinaman has not been celebrating his birthday every six months.

INADVERTENCE.

IN reply to natural expostulation we admit that the advertisement wherein an impossible virtue was claimed for a particular ointment was inserted without due attention to its contents. We much regret the inadvertence.

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[1] Minnesota Med., June, 1928, p. 406.

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STUDENTS' GUIDE—SESSION 1928-1929.

GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION OF THE UNITED KINGDOM.

POWERS, DUTIES, AND CONSTITUTION.

The General Council of Medical Education and Registration of the United Kingdom is, first, a registering body: no person, even though his qualifications have been obtained by examination, is a *legally qualified* medical practitioner until his name appears on the Medical Register. Secondly, it is a standardising body, ensuring that medical education reaches an efficient minimum standard by scientific examination. Thirdly, it is a penal and disciplinary body, having power to remove from the Register any practitioner convicted of felony or misdemeanour or adjudged guilty of professional misconduct. Fourthly, to the Council is committed the codification of pharmaceutical remedies. The duties of the Council are thus primarily of a public nature, and its construction shows its fitness for its fourfold responsibilities.

The Council consists of 38 members, of whom all but 11 are official representatives of some corporate body. Five members are chosen by the Crown on the advice of the Privy Council, and six others are elected by the members of the medical profession as Direct Representatives. The Crown members need not be medical men and one layman now sits on the Council. Three members are appointed for dental business by the Privy Council under the Dentists Act, 1921, under which the powers and duties of the General Medical Council with regard to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the Dental Board of the United Kingdom.

The Educational Curriculum.

Professional Education.—The course of professional study after registration as a student occupies at least five years. The Final Examination in Medicine, Surgery, and Midwifery must not be passed before the close of the fifth academic year of medical study.

Regulations as to Registration of Medical Students.

Before registration as a student every candidate should produce evidence that (*a*) he has attained the age of 17 years; (*b*) that he has passed a recognised examination in general education; and (*c*) that, *in addition thereto*, he has passed, or obtained exemption from, an examination, theoretical and practical, in elementary physics and elementary chemistry conducted or recognised by a licensing body. The minimum standard of General Education required is that of University Matriculation or entrance examination in the Faculties of Arts or Pure Science. In other Faculties the examination must be of the standard prescribed in Regulation 2 below.

An approved course of instruction in elementary biology at a secondary school or other teaching institution recognised by a licensing body may admit a student to the professional examination in elementary biology upon registration as a medical student.

The candidate commencing medical study should apply to the registrar of the division of Great Britain and Ireland in which he is residing, according to a prescribed form, copies of which may be had on application to the several licensing bodies, medical schools, and hospitals, or at the offices of the Council; and should produce proof that he, or she, has fulfilled the first three conditions.

The Maintenance of the Register of Medical Students.

1. The Education Committee prepares and issues from time to time a list of examining bodies whose examinations in general education fulfil the conditions of, and are specially recognised by, the Council.

2. The Council has recognised the undernoted university examinations which are conducted in Great Britain and admit to the Faculties of Arts or Pure Science, or to other Faculties, subject to the conditions specified below:—

Oxford University, Responsions; Cambridge University, The Previous Examination. The Matriculation Examinations of the following Universities: Birmingham, Bristol, Durham, Leeds, Liverpool, London, Victoria of Manchester, Sheffield and Wales, and the Entrance or Preliminary Examination of the Universities of Scotland.

The condition prescribed by the Council in Faculties other than Arts or Pure Science is that:—

The certificate shall bear evidence that the candidate has passed in the Matriculation or Entrance standard, in the following subjects, viz.: (*a*) English. (*b*) Mathematics, Elementary. (*c*) A language other than English. (*d*) A fourth subject, as defined in the regulations of the particular Examination, to be chosen from the subjoined list, viz.: History, Geography, Physical Science, Natural Science; Latin, Greek, Hebrew, French, German, or other language accepted by the University for the purpose of matriculation or entrance.

3. Subject to the condition prescribed above (Section 2), the Council will recognise those of the examinations conducted by recognised authorities in Great Britain which are accepted by any one or more of the above-named Universities as equivalent (under prescribed conditions as to "credits" or "grades"), for purposes of Entrance or Matriculation, to an Examination named in the preceding list (Section 2). Such Examinations are:—

Bristol University: Higher School Certificate Examination; School Certificate Examination. Cambridge Local Examinations Syndicate: Higher School Certificate Examination; School Certificate Examination. Central Welsh Examination Board: Higher Certificate Examination; School Certificate Examination. Durham University: Higher Certificate Examination; School Certificate Examination. London University: Higher School Certificate Examination; General School Examination. Northern Universities Joint Matriculation Board: Higher Certificate Examination School Certificate Examination. Oxford and Cambridge Schools Examination Board: Higher Certificate Examination; School Certificate Examination. Oxford Delegacy for Local Examinations: Higher School Certificate Examination; School Certificate Examination. Scottish Education Department: Leaving Certificate Examination.

4. The Council will continue to recognise certain Examinations conducted by Educational Bodies, other than those (mentioned in Section 3) whose Examinations are accepted by any one or more of the Universities of Great Britain. Recognition will not be extended under this Section to any Examination unless the Council is satisfied (*a*) that in scope and standard it is equivalent to a recognised Matriculation or Entrance Examination of a University of Great Britain, (*b*) that it fulfils the condition prescribed by the Council (Section 2), and (c) that the Examination has been completed at not more than two sittings. Such Examinations are:—

The College of Preceptors (England): Senior Certificate. The Educational Institute of Scotland: Preliminary Medical Certificate.

5. Subject to the prescribed condition (Section 2), the Council will recognise the Entrance Examination to the School of Physic of the University of Dublin, and the Matriculation or Entrance Examinations of the National University of Ireland, the Queen's University of Belfast, the Irish Royal Colleges of Physicians and Surgeons: and also the Leaving Certificate of the Department of Education of the Irish Free State, the Senior Grade Leaving

Certificate of the Ministry of Education of Northern Ireland, and all examinations accepted by any one or more of the Universities of Great Britain or Ireland. as equivalent, for purposes of entrance or matriculation, to the above-named University Examinations.

6. Subject to the prescribed condition (Section 2), the Council will recognise all Examinations of Colonial or Foreign Universities which are accepted by any one or more of the Universities of Great Britain as equivalent, for purposes of entrance or matriculation, to an examination named in the list of examinations recognised by the Council (Section 2).

7. The Council will recognise the Final Examinations for Degrees in Arts or Science of any University of Great Britain or Ireland or of the British Dominions.

8. The registration of medical students shall be placed under the charge of the Branch Registrars.

9. Each of the Branch Registrars shall keep a register of medical students.

10. The Branch Registrar shall enter the student's name and particulars in the Students Register, and give him a certificate of such registration.

11. Each of the Branch Registrars shall supply to the several licensing bodies, medical schools, and hospitals, in that part of Great Britain or Ireland of which he is Registrar, blank forms of application for the registration of medical students.

12. A copy of the Medical Students Register prepared by each of the Branch Registrars shall be transmitted, on or before Dec. 31st in each year, to the Registrar of the General Council, who will distribute the list to the licensing bodies, medical schools, and hospitals.

All applications for special exceptions to the foregoing regulations as to registration shall be addressed to the Registrar of the General Council, and shall be decided by authority of the Education Committee, who shall report thereon to the Council.

The Medical Schools and Colleges.

The Universities, including their Colleges and Medical Schools, and Schools of Medicine at which Medical Study may be commenced in the United Kingdom are set out seriatim in the following pages.

MEDICAL REGISTRATION IN IRELAND.

Within the past few months the problem of medical registration in the Irish Free State, which had given rise to some anxiety during the past two years, has been satisfactorily settled. By agreement between the Governments of Great Britain, of the Irish Free State, and of Northern Ireland—since confirmed by legislature at Westminster and Dublin—the powers and duties of the General Council of Medical Registration and Education are to continue as heretofore in respect of qualifying bodies in the Irish Free State, and of medical practitioners qualified in the Irish Free State. Side by side with this a Medical Council has been set up in the Irish Free State with the duty of establishing and controlling a Register for the Irish Free State. Practitioners whose names are on the General Register, and persons who pass a qualifying examination in the Irish Free State, will be registered on the Irish Free State Register on payment of the prescribed fee. The Irish Free State Medical Council have, over those whose names are on the Irish Free State Register, the same disciplinary powers as are possessed by the General Council over those whose names are on the General Register. To possess the privileges of a qualified practitioner in the Irish Free State it is necessary to be registered in the Irish Free State Register.

The net result of the change in the law as regards the practitioner qualifying in the Irish Free State in the future is that: (1) If he intends to practise only in the Irish Free State he need only register in the Irish Free State Register; (2) if he intends to practise in Great Britain he will register in the General Register: and (3) if he is in doubt where he will practise he will register in both Registers. He will, as he registers in one Register, or in both Registers. put himself under the disciplinary control of the one Council or of both Councils. No practical inconvenience is caused, and practitioners qualified in the Irish Free State in future will not find themselves deprived of any of the privileges or rights enjoyed by their predecessors.

THE DENTAL BOARD OF THE UNITED KINGDOM.

Anyone who is on the Medical Register is entitled to practise as a dentist, although he cannot register as such without degree or licence in dentistry; but it is a distinct advantage to take a special dental qualification, otherwise few dental appointments at general or special hospitals or dispensaries are available, and, unless registered in the Dentists Register, no dental work, under the additional Benefit Scheme of the National Health Insurance Act can be undertaken.

Under the Dentists Act, 1921, the powers and duties of the General Medical Council under the Dentists Act, 1878, and under the Medical Act, 1886, which related to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the then newly constituted Dental Board of the United Kingdom. The registration of dental students at the commencement of their dental studies, and the right of erasure of a name from the Dentists Register, remain with the Council, but the duty of inquiring into disciplinary cases rests with the Board, upon whose recommendations the Council acts.

The Dental Board consists of a chairman and 12 members. The chairman is appointed by the Privy Council. Other members of the Board are appointed by the Minister of Health, the Scottish Board of Health, the Governor-General of Northern Ireland, the General Medical Council (3), Direct Vote of the qualified dentists practising in England and Wales, Scotland, and Ireland (3), Direct Representatives by registered dentists not being qualified dentists (2).

Registration of Dental Students.

The General Medical Council's Regulations in regard to the registration of dental students which came into force on Jan. 1st, 1923, provide that the registration of dental students shall be carried on at the General Medical Council Office in London, in the same manner as that of medical students, and be subject to the same regulations as regards age and preliminary examinations; but in the case of dental students professional study may commence either at a recognised dental hospital or school, or by pupilage with a registered dental practitioner.

Candidates for a diploma in dental surgery should produce certificates of having been engaged for at least four years in professional studies, and of having received during 24 calendar months instruction in dental mechanics. It is recommended that instruction in dental mechanics be taken at a recognised dental hospital and school. If any part of such instruction be taken by the candidate as a pupil with a registered dental practitioner, the time required to be devoted to it shall be at least twice the time required for the corresponding instruction taken at a dental school. Two years' *bona-fide* apprenticeship with a registered dental practitioner, after registration as a dental student, may be counted as one of the four years of professional study. When a student can show evidence of regular pupilage in dental mechanics to a registered dental practitioner, prior to the passing of the prescribed preliminary and scientific examinations, he may be allowed to antedate his registration for a period not exceeding one year prior to the passing of these examinations.

THE OFFICES.

The address of the Registrar, to whom further communications should be addressed, is as follows: The Registrar of the General Medical Council, 44, Hallam-street, Portland-place, London, W. 1. The offices of the Dental Board are adjoining.

A memorandum on the procedure to be adopted by those who desire to enter the profession of medicine, with notes on costs and prospects, and a similar Memorandum in regard to Dentistry, may be obtained on payment of 1*s*. each.

THE MEDICAL EXAMINING BODIES AND SCHOOLS OF THE UNITED KINGDOM.

A GUIDE TO THE FACILITIES FOR OBTAINING THE VARIOUS MEDICAL DEGREES AND OTHER QUALIFICATIONS FOR THE BRITISH MEDICAL REGISTER.

I.—ENGLAND AND WALES.

THE UNIVERSITIES.

UNIVERSITY OF OXFORD.

THERE are two degrees in Medicine, *B.M.* and *D.M.*, two in Surgery, *B.Ch.* and *M.Ch.*, and diplomas in *Public Health* and *Ophthalmology*. The examinations are open to men and women alike.

Only Graduates in Arts of the University are eligible for the Medical and Surgical degrees. The most convenient course for the B.A. degree for intending graduates in Medicine is to take Responsions, the *Preliminary Science* Examinations mentioned below, and the Final Honour School of Physiology. To obtain the degrees of B.M. and B.Ch. the following examinations must be passed: 1. Preliminary subjects: Physics and Chemistry, Zoology, and Botany. 2. Professional. (*a*) First Examination: Subjects—Organic Chemistry, unless the *candidate* has satisfied the examiners in Part I. Chemistry in the Honour School of Natural Science; Human Physiology, unless he has obtained a First or Second Class in Animal Physiology in the Honour School of Natural Science; Human Anatomy. (*b*) Second Examination: Subjects—Medicine, Surgery, Midwifery, Pathology, Forensic Medicine with Hygiene, Materia Medica and Pharmacology. The First and Second Professional examinations are held in June and December. The first B.M. examination may be passed at any time after the Preliminary Scientific examinations. Anatomy and Physiology must be passed at the same time—Organic Chemistry may be taken separately.

At any time after passing *First B.M. Examination*, the candidate can, on producing certificates, present himself for examination in the subjects of Pathology, Forensic Medicine with Hygiene, Materia Medica and Pharmacology; but cannot, unless he is already a registered medical practitioner, enter for examination in Medicine, Surgery and Midwifery until the eighteenth term from his matriculation, nor until a period of at least thirty-three months has elapsed from the date of passing the First B.M. Examination. He must pass in Medicine, Surgery and Midwifery at one and the same time.

Before admission to the Examinations in Pathology and Bacteriology, and Materia Medica and Pharmacology, of the *Second B.M. Examination*, the student must produce certificates of having attended courses of instruction including practical work in Pathology, Bacteriology, Post-mortem Clerking, Pharmacology, and Pharmacy, either in Oxford or in a recognised Medical School. Before admission to the remainder of the second B.M. Examination, he must produce a number of other certificates, including certificates of having acted as Clinical Clerk and Dresser, each for six months in the Wards, of instruction in Midwifery and of attendance on Labours, of instruction in Infectious Diseases and in Ophthalmology, of proficiency in Vaccination and in the administration of Anæsthetics, and of three academic years of hospital practice.

The degree of Bachelor of Surgery (B.Ch.) is granted with that of B.M. after passing the above examinations.

The degree of Doctor of Medicine (D.M.) is granted to Bachelors of Medicine of the University who have entered upon their thirtieth term from Matriculation, and have submitted a dissertation which is approved by the examiners for the B.M. degree whose subjects are dealt with therein and by Professors in the Faculty of Medicine. The degree of Master of Surgery (M.Ch.) is granted after examination to Bachelors of Surgery who have entered upon their twenty-first term, and who are members of the surgical staff of a recognised hospital, or have acted as dresser or house surgeon in such a hospital for a *period of six months*. The examination, which includes Surgery, Surgical Anatomy and Pathology and Surgical Operations, is held annually in June, after the Second B.M. examination.

The examinations for the Diploma in Public Health in two parts are held in Trinity and Michaelmas terms; that for the Diploma in Ophthalmology is held annually in July. (See p. 421.)

Travelling Fellowship, Scholarships, and Prizes.—A Radcliffe Travelling Fellowship is awarded annually after an examination held in February. It is tenable for two years and of the annual value of £300. The examination is in Physiology, Pathology, and Hygiene, and is partly "practical." Candidates must be graduates in Medicine of the University. The holder must travel abroad for the purpose of medical study. Application should be made to the Radcliffe Examiners, Department of Medicine, University Museum. A Christopher Welch Scholarship of £100, tenable for four years, is awarded annually after examination. Candidates must be men undergraduate members of the University, who have not exceeded the twelfth term from their matriculation, or been admitted to any degree in the University. They may offer any one of the subjects, Animal Physiology, Botany, Zoology. A George Herbert Hunt Travelling Scholarship of the value of about £100 is awarded every second year to enable a Bachelor of Medicine to undertake three months' study abroad. A Rolleston Memorial Prize is awarded once in two years to members of the Universities of Oxford and Cambridge of not more than ten years' standing for an original research in some Biological subject, including Physiology or Pathology. The Radcliffe Prize, founded by University College (1907), is of the value of £50 and is awarded biennially (alternating with the Rolleston Memorial Prize) for research in some branch of medical science. The Theodore Williams Scholarships, each of the value of £50 a year for two years, are awarded annually in the subjects of Anatomy, Physiology, and Pathology. A Radcliffe Scholarship in Pharmacology, of the value of £50 for one year, is awarded annually by the Master and Fellows of University College. A King's College Hospital Burney Yeo Scholarship of £80 is awarded each year on the nomination of the Regius Professor of Medicine. The Scholarships and Exhibitions in Science which are offered by most Colleges are open to those who intend to pursue Medicine. The value of these scholarships varies, according to the Candidate's need, between £30 and £100 a year; the exhibitions vary in value from £30 to £100 per annum. The *number* of scholarships and exhibitions in Science offered annually is about forty. There are also Medical Scholarships of the value of £100 a year at University College and at Pembroke College. The Welsh Memorial Prize for Anatomical drawing is awarded annually, and is of the value of about £10.

More detailed information may be obtained from the University Calendar; *from the* Examination Statutes, 1923; from the Regius Professor of Medicine; from the Professors in the departments of medical science; and from the Dean of the Medical School, Oxford.

UNIVERSITY OF OXFORD: RADCLIFFE INFIRMARY AND COUNTY HOSPITAL.—225 beds. Courses of instruction are given in connexion with the Oxford University Medical School. These include (1) a course in Practical Medicine by the Regius Professor of Medicine; (2) clinical lectures by the *Litchfield*

Lecturers in Medicine and Surgery; and (3) tutorial instruction and demonstrations in special Regional Anatomy (medical and surgical), methods of Medical and Surgical Diagnosis, and Surgical Manipulation. (4) Pathological demonstrations and instruction in post-mortem work are given by the Assistant Pathologist. Opportunities are offered to students who wish to act as surgical dressers and clerks. A post-graduate course is held in the hospital in the autumn of each year.

UNIVERSITY OF CAMBRIDGE.

There are two degrees in Medicine, *M.B.* and *M.D.*, two in Surgery, *B.Chir.* and *M.Chir.*, and Diplomas in *Public Health and Hygiene*, *Tropical Medicine* and *Hygiene*, and *Medical Radiology and Electrology.* Increased facilities have been given to women students at Girton and Newnham, who are admitted to the *M.B.* Examinations.

The student must enter a College, or become a non-collegiate student, and keep nine terms (three years) by residence. He must pass the Previous Examination of the University before he comes into residence or therefrom obtain exemption, particulars of which may be obtained from the Registrar. He may then devote himself to medical study in the University. Or he may, as nearly all students now do, proceed to take a degree in Arts by passing the Examinations for the Ordinary B.A. degree, or an Honours degree by passing a Tripos Examination. The Natural Sciences Tripos is taken most frequently by medical students, as some of the subjects are practically the same as those for the First and Second M.B. examinations.

For the degree of Bachelor of Medicine (*M.B.*) five calendar years of medical study are required either in Cambridge or at one of the recognised Schools of Medicine. The first three or four years are usually spent in Cambridge till the student has passed the examination for Part I. of the Natural Sciences Tripos and the *First and Second M.B. examinations.* Hospital practice may be attended in Cambridge, but until the student has completed the course for the *Third part of the Second M.B.* it cannot count towards the two and a half years of hospital practice required before admission to the first part of the Third M.B. The laboratories for Botany, Chemistry, Physics, Biology, Zoology, Human Anatomy, Physiology, Biochemistry, Pathology, Bacteriology, Pharmacology, Psychology, and Public Health are well equipped. Addenbrooke's Hospital, the Infectious Diseases Hospital, the Cambridge Research Hospital, and the Field Laboratories are utilised for study and research.

There are three examinations for M.B. The *First* includes (1) General and Inorganic Chemistry, (2) Mechanics, (3) Physics, and (4) Elementary Biology. These parts may be taken together or separately. The *Second* is divided into three parts—viz. (1) Organic Chemistry, (2) Human Anatomy and Physiology, and (3) Pharmacology and General Pathology. The *Third* is divided into two parts: (1) Principles and Practice of Surgery (including Special Pathology and Midwifery and Diseases Peculiar to Women); and (2) Principles and Practice of Physic (including Diseases of Children, Mental Diseases, Medical Jurisprudence), Pathology (including Hygiene and Preventive Medicine), and Pharmacology (including Therapeutics and Toxicology). The examinations are partly in writing, partly oral, and partly practical, in the hospital, in the dissecting room, and in the laboratories. An Act has then to be kept by the candidate reading an original dissertation composed by himself and being examined orally on some subject approved by the Regius Professor of Physic. Candidates who have passed both parts of the Third M.B. examination are admitted to the registrable degree of Bachelor of Surgery (B.Chir.) without separate examination and without keeping an Act.

The degree of Doctor of Medicine (M.D.) may be taken three years after that of M.B. or four years after that of M.A. The candidate is required to produce certificates of having been engaged in Medical Study for five calendar years, and if an M.A. to pass the same examinations as are required for the degree of M.B. An Act has to be kept, consisting of an original Thesis with *viva voce* examination; and a short extempore essay has to be written on a topic taken from the general subject of his thesis, whether it be Physiology, Pathology, Pharmacology, the Practice of Medicine, State Medicine, or the History of Medicine.

Candidates for the Degree of Master of Surgery (M.Chir.) who are M.A.'s may be admitted to the examination after they have become legally qualified under the *Medical Acts* to practise surgery. Others may be admitted to the examination when two years at least have elapsed after they have completed all that is required of candidates for the Degree of B.Chir. He is required to pass an examination in Principles and Practice of Surgery, Surgical Anatomy and Surgical Operations, and Pathology, and to write an extempore essay on a Surgical Subject.

Diplomas are granted in Public Health, in Hygiene, in Tropical Medicine and Hygiene, and in Medical Radiology and Electrology. Candidates must hold a recognised medical qualification. (See p. 421.)

Scholarships and Prizes.—Medical studies are endowed by the numerous Natural Science scholarships at the various colleges, information about which can be obtained from the respective Tutors. There are Natural Science scholarships at most of the colleges and prizes in the ancillary medical subjects. Some of these are entrance scholarships; some may be gained by students already in residence, and where suitable candidates are not forthcoming among such students the emoluments may be allotted to members of other colleges. A valuable scholarship instituted on behalf of Medicine is the Tancred Studentship in Physic, tenable at Gonville and Caius College. The successful candidate must enter at the college within a month or remove there if he be a member of any other college. Students are required to take the degree of M.B. as soon as they are of sufficient standing but may hold the Studentship for a further three years. Thus a student elected previous to admission to college can draw the emolument, the annual value of which is about £90, for eight years. Full particulars can be obtained from Mr. E. T. Gurdon, 28, Lincoln's Inn-fields, London. Among other scholarships and prizes may be mentioned the Balfour Studentship, for research in Biology, of the value of £300 a year for three years, not restricted to members of the University; the Frank Smart Studentship and Prizes for Botany and Zoology, and the Shuttleworth Studentship for Zoology or Physiology tenable at Gonville and Caius College. The one University Prize in Medicine, the Raymond Horton Smith Prize, is awarded to that candidate for the degree of M.D. who presents the best thesis for the degree during the academical year, provided that he has taken honours in a Tripos Examination.

An abstract of the Regulations and Schedules of the range of the examinations in Chemistry, Mechanics, Physics, Biology, Pharmacology, and General Pathology may be obtained upon application to the Registrary, The Registry, Cambridge.

ADDENBROOKE'S HOSPITAL.—100 beds. Clinical Lectures in Medicine and Surgery, in connexion with Cambridge University Medical School, are given at this hospital twice a week during the academical year; and practical instruction in Medicine and Surgery is given in the wards and out-patients' rooms by the physicians and surgeons daily during the term time and vacations. The fee for pupilship is 3 guineas a term, 9 guineas a year, 12 guineas perpetual. Further information may be obtained from Dr. Aldren Wright.

UNIVERSITY OF LONDON.

The University of London in 1900 was reconstituted under the Act of Parliament, 1898, and became a teaching as well as an examining body. Under the developments upon the Internal side all the metropolitan medical schools became constituent colleges, while Clinical Units have been established at St. Bartholomew's, the London, St. Mary's, St. Thomas's, University College Hospital, and the Royal Free Hospital.

Internal and External Students.—All the examinations of this University are open to men and women alike. Matriculated students of the University may be either internal or external. Internal students of the University are students who have matriculated at the University and who are pursuing a course of study approved by the University, either (*a*) under the direct control of the University or a committee appointed thereby; or (*b*) under one or more of the appointed or recognised teachers of the University. Centres for preliminary and intermediate medical studies have been established by the University at University and King's Colleges.

UNIVERSITY COLLEGE.—University College has been constituted a University centre for the teaching of medical sciences. The College Faculty of Medical Sciences comprises the Departments of Physics, Chemistry, Botany, and Zoology (the Preliminary Medical Sciences); also the Departments of Anatomy, Histology, Physiology, Biochemistry, and Pharmacology (the Intermediate Medical Sciences), and the Department of Hygiene and Public Health. Research work is undertaken in all departments. The completion of the Institute of Medical Sciences, which the generosity of the Rockefeller Foundation made possible, provides exceptional facilities for research and post-graduate study in anatomy, physiology, and pharmacology. In particular might be specified the opportunities for investigation in human and comparative embryology and neurology, in histology, radiology, anthropology, biochemistry, and experimental physiology and experimental embryology. Arrangements exist for the close correlation of work in the Institute with University College Hospital and Medical School. Women students are admitted.

Scholarships and Prizes.—The first four items on the present list require a complete intermediate course at University College. The money value and subjects at examinations are as follows: (*a*) The Bucknill Scholarship, 160 guineas; (*b*) *and* (*c*) two Entrance Exhibitions, 55 guineas each, Chemistry, Physics, Botany, and Zoology; (*d*) Entrance Scholarship, £30 a year for three years; (*e*) Cluff *Memorial* Prize, £15 biennially, Anatomy, Physiology, Pharmacology, and Chemistry; (*f*) Schafer Prize in Physiology, £18 triennially; (*g*) Sharpey Physiological Scholarship, £115, Biological Sciences; (*h*) Morris Bursary for sons of deceased professional men, by *nomination*, tenable for two years, £16 a year; and (*i*) five Gold and five Silver Medals awarded annually in various departments. For further information apply to the Dean of the Medical Faculty, University College, W.C.

KING'S COLLEGE.—The Medical Faculty at this College gives instruction in the subjects of Medical Science for the Preliminary and Intermediate Examinations in Medicine and Surgery, and Dental Surgery, of the University of London and of other Universities and examining bodies, to students entering the College directly, and also to students of the following four hospital schools which prepare only for the final examinations—viz., King's College Hospital, Westminster Hospital, St. George's Hospital, and Charing Cross Hospital. The Faculty is open to both men and women.

Scholarships and Prizes.—Two Warneford Entrance Scholarships of £30 each for four years. Examination in April, subjects selected from Divinity, Classics, Science. Sambrooke Scholarship of £30 for three years. Examination in April, subjects selected from Classics, Science. Worsley Scholarships: £100 in five annual instalments of £20. *At the end of the First Year* of study, the Rabbeth Scholarships (£30 and £15), the Carter Gold Medal and Prize in Botany, and the Hare Prize in Zoology are open for competition. *At the end of the Second Year*, the Second Year's Scholarship (£20) is open for competition. *At the end of the Third Year*, the Hughes Prize in Anatomy, the Huxley Prize in Physiology, the Inchley Prize in Pharmacology, and the Jelf Medal are open for competition. The Layton and the Berridge Research Studentships (£150 per annum each), the Daniell Scholarship in Chemistry (£40), Warneford Prizes (£25 and £15), Leathes Prize, Barry Prize, &c., are also open to Students of this Faculty. The majority of the Scholarships and Prizes are open to Regular Students only. For further information apply to the Dean of the Medical Faculty.

Medical students of the University of London, who are pursuing their medical curriculum in the metropolis will proceed to one of the recognised medical schools connected with the University. At four of these schools the preliminary studies will be taken at King's College, while at the other schools the whole curriculum can be taken out in connexion with the selected hospital. These hospitals are St. Bartholomew's Hospital, Charing Cross Hospital, St. George's Hospital, Guy's Hospital, King's College Hospital, the London Hospital, St. Mary's Hospital, the Middlesex Hospital, St. Thomas's Hospital, University College Hospital, Westminster Hospital, and the London (Royal Free Hospital) School of Medicine for Women. Various schools and hospitals are also recognised as schools of the University in special departments, and students may pursue their studies at other approved universities and medical schools, presenting themselves for examination at the University.

Faculty of Medicine.

The Faculty of Medicine of the University grants the joint degrees of M.B., B.S. (*Bachelor of Medicine and Surgery*), the higher separate degrees of M.D. (*Doctor of Medicine*) and M.S. (*Master of Surgery*), and the degree of B.D.S. (*Bachelor of Dental Surgery*) and the degree of B.Pharm. (*Bachelor of Pharmacy*); the two higher degrees being open only to candidates holding the M.B., B.S degrees of the University. The curriculum for the M.B., B.S. degrees is five and a half years from the time of matriculation, with certain exceptions which must be looked for in the official regulations of the University.

A. *Internal Students.*—For the Bachelor's degrees in Medicine and Surgery a student must normally, *after* registration as an internal student, have: (1) Attended prescribed courses of study for five and a half years in one or more schools of the University. (2) Passed the following examinations, under the conditions mentioned below: (*a*) The First Examination for Medical Degrees in Inorganic Chemistry, Physics, including Mechanics, and General Biology; (*b*) the Second Examination for Medical Degrees: Part I., Organic Chemistry; Part II., Anatomy, Physiology, and Pharmacology; (*c*) the Third Examination for Medical Degrees, or M.B., B.S. Examination in Medicine, Surgery, Obstetrics and Gynæcology, Pathology, Forensic Medicine, and Hygiene.

B. *External Students.*—For the Bachelor's degrees in Medicine and Surgery an external student must (1) have passed the Matriculation examination or have been exempted therefrom under Statute 116 not less than five and a half years previously; (2) have passed subsequent examinations similar to those required of an internal student; and (3) have been engaged in professional studies during the five and a half years subsequently to *Matriculation* and four and a half years subsequently to passing the First Examination for Medical Degrees at one or more of the medical institutions or schools recognised by this University for the purpose, one year at least of the four and a half years to have been spent in one or more recognised institutions or schools in the United Kingdom.

The First Examination for Medical Degrees (*Inorganic Chemistry, Physics, including Mechanics, and General Biology*) will take place twice in each year, commencing on the Monday following Dec. 7th and on the first Monday in July. It must be passed not less than nine months after matriculation.

The Second Examination for Medical Degrees (*Part I.*)*: Organic Chemistry.*—This examination will take place twice in each year, commencing on the Thursday following the second Monday in March and on the Thursday following the first Monday in July. No candidate will be admitted to this examination until he has completed the First Examination.

The Second Examination for Medical Degrees (*Part II.*) takes place twice in every year, commencing on the Tuesday following the third Monday in March and on the Tuesday following the first Monday in July. No candidate shall be admitted to the examination unless he has passed the First Examination for Medical Degrees at least 18 months previously, and has passed Part I. of the Second Examination for Medical Degrees.

The Third or M.B., B.S. Examination.—The M.B., B.S. examination takes place twice in each year, commencing on the second Monday in November and on the first Monday in May. No candidate will be admitted to this examination unless he has completed the Second Examination for Medical Degrees, together with a course of study summarised below, nor within three years from the date of passing the Second Examination, Part II., in Anatomy and Physiology. The course of study comprises introductory course in (1) Clinical Medicine; (2) Clinical Surgery; and (3) Clinical Pathology; (4) Experience as Clinical Clerk; (5) Clinical Medicine; (6) (*a*) Fevers, (*b*) Children's Diseases, (*c*) Venereal Diseases, (*d*) Mental Diseases (at a recognised Asylum), (*e*) Dermatology, (*f*) Vaccination, (*g*) Materia Medica and Pharmacy; (7) Experience as a Surgical Dresser; (8) Clinical Surgery; (9) Ophthalmology; (10) Oto-Rhino-Laryngology; (11) (*a*) Operative Surgery, (*b*) Applied Anatomy, (*c*) Administration of Anæsthetics, (*d*) Dental Surgery, (*e*) Orthopædic Surgery; (*f*) Mechano-therapeutics; (12) Obstetrics and Gynæcology; (13) Lying-in Hospital; (14) The conduct of at least 20 Labours; (15) Antenatal Clinic; (16) Experience as a Clinical Clerk in Gynæcological Work; (17) General Pathology, Morbid Anatomy, Bacteriology, and Chemical Pathology; (18) Work in the Post-Mortem Room; (19) Clinical Laboratory; (20) Forensic Medicine; (21) Hygiene. He must have attended the Medical and Surgical Practice of a recognised hospital for two years, and have held the posts of clinical clerk and surgical dresser for periods of six months each. Candidates will be examined in Medicine, Pathology, Forensic Medicine and Hygiene, Surgery, Obstetrics and Gynæcology. The subjects may be divided into two groups—namely: (1) Medicine, Pathology, Forensic Medicine, and Hygiene; and (2) Surgery, Obstetrics, and Gynæcology. These groups may be taken either separately or together. Bachelors of Medicine who graduated before May, 1904, may obtain the B.S. by passing the Surgical part of the M.B., B.S.

Doctor of Medicine.—The examination for this degree takes place twice in each year, commencing on the second Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches—namely: (1) Medicine; (2) Pathology; (3) Psychological Medicine; (4) Midwifery and Diseases of Women; (5) State Medicine; and (6) Tropical Medicine. Any candidate for the degree of M.D. (except in branch 5) may transmit to the Registrar a thesis for approval and may be exempted from a part or from the whole of the written examination.

Master of Surgery.—The examination for the degree of Master of Surgery takes place twice in each year: (1) Surgery; (2) Dental Surgery; (3) Ophthalmology; (4) Laryngology, Otology, and Rhinology. A thesis may be submitted as for M.D.

Bachelor of Pharmacy.—The course extends over three years.

Full details of the prescribed curricula can be obtained free on application to the Academic Registrar, University of London, South Kensington, S.W.7.

MEDICAL SCHOOLS OF THE UNIVERSITY OF LONDON.[1]

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.—The hospital contains 757 beds, of which 687 are for patients in the hospital at Smithfield and 70 at the Alexandra Hospital, Swanley. Special departments have been organised for Diseases of Women and Children, the Eye, Ear, Larynx, and Skin, as well as for Orthopædic and Dental Surgery, and for Electro-therapeutics and X Ray work. Whole-time Clinical Units under Professors of Medicine and Surgery have been established.

Ten house physicians and ten house surgeons are appointed annually, are provided with rooms and board, and receive £80 a year as salary. A resident midwifery assistant, an ophthalmic house surgeon, and a house surgeon for diseases of the throat, nose, and ear, and a house surgeon for orthopædic surgery are appointed every six months, and are provided with rooms and board and receive a salary of £80 a year. Three resident administrators of anæsthetics are appointed, the senior for one year at a salary of £150, and two juniors for six months with a salary at the rate of £80 per annum with board and rooms. An extern midwifery assistant is appointed every three months, and receives a salary of £80 a year. The clinical clerks, the obstetric clerks, the clerks to the medical out-patients, the dressers to the surgical in-patients and to the out-patients, and the dressers in the special departments are chosen from the students. A residential College is attached to the hospital.

There are quarters for the resident staff, casualty, medical, surgical, and special out-patient departments, casualty wards, dispensary, and clinical lecture theatre. There is a chemical laboratory attached to the College as well as a laboratory devoted to instruction in Public Health. A block is devoted to Pathology, and contains the post-mortem room as well as extensive laboratories for bacteriology, clinical pathology, and pathological chemistry. *The Medical College Buildings* include three large lecture theatres, a large dissecting room, laboratories for chemistry, biology, morbid anatomy and histology, and public health, as well as a spacious library (containing 14,500 volumes), a well-appointed museum of anatomy, physiology, comparative anatomy, materia medica, botany, and pathological anatomy. The pathological museum is complete. A new block in Giltspur-street has recently been acquired and has been fitted up as lecture theatres and laboratories for physics, chemical physiology, experimental physiology, histology, and pharmacology.

Special Classes for the Primary and Final F.R.C.S. are held twice yearly. *Instruction in Preliminary Science* is given to University of London students in chemistry, biology, and physics throughout the year. Facilities for research work are afforded in the Clinical Units and Laboratories of pathological and other departments. *A Vacation Post-graduate Course*, adapted to general practitioners, is given annually.

Scholarships given in aid of Medical Study.—For five of the Scholarships and the Exhibition—namely, (*a*), (*b*), two Entrance Scholarships in Science of the respective values of £75 and £100; (*c*) Entrance

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[1] Of these schools that of the Royal Free Hospital is reserved for women; University College admits men and women to the whole course, the number of women being limited; King's College admits men and women to the Intermediate subjects; the remainder admit men only.

Scholarship in Arts, £100; (*d*) Jeaffreson Exhibition, £50; and (*e*) Shuter Scholarship, £50—a full or University course at St. Bartholomew's Hospital is required. The awards of (*a*) and (*b*) are made after examination in selections from the subjects of Chemistry, Physics, Zoology, Botany, Physiology, Anatomy, and Pathology; (*c*) and (*d*) are awarded after examination in Mathematics, Latin or Greek or French or German, a second language or Chemistry or Physics; (*e*) is awarded after competitive examination among Cambridge Graduates in Anatomy and Physiology. The more important of the other Scholarships and prizes are as follows:—Four Junior Scholarships—(*f*) No. 1, £30, Anatomy and Physiology; (*g*) No. 2, £20, Anatomy and Physiology; (*h*) No. 3, £25, Chemistry, Physics, and Biology; (*i*) No. 4, £15, Chemistry, Physics, and Biology: (*j*) Senior Scholarship, £50, Anatomy, Physiology, and Chemistry; (*k*) Kirkes Scholarship, £30 and medal, Clinical Medicine; (*l*) and (*m*) two Brackenbury Scholarships, £39 each, one in Medicine and one in Surgery; (*n*) Sir G. Burrows Prize, 10 guineas, Pathology; (*o*) Skynner Prize, 13 guineas, Regional and Morbid Anatomy; (*p*) Matthews Duncan Medal and Prize, £20, Midwifery and Gynæcology; (*q*) Luther Holden Research Scholarship in Surgery, awarded by election, £105; (*r*) Lawrence Research Scholarship and Gold Medal in Pathology, awarded by election, £115; and (*s*) Baly Scholarship in Clinical Medicine, £75, awarded by examination.

The recreation ground of 10 acres is at Winchmore Hill for the use of the members of the Students' Union, which all students are expected to join. The Students' Union contains a large reading and smoking room, a committee and writing room, luncheon and dining hall, and a miniature rifle range.

Information may be obtained on application to the Dean of the Medical College: Dr. T. W. Shore. The Warden of the Residential College is Mr. R. M. Vick.

CHARING CROSS HOSPITAL.—The Hospital, to which the School is attached, contains 300 beds. There are special departments for Mental Diseases, Midwifery, Diseases of Women, of Children, of the Skin, Ear, Throat, Nose, and Teeth, for Orthopædic Cases, X Ray work, and for Electrical Treatment.

In the Medical School Demonstratorships and Assistant Demonstratorships are open to students of the School. Six House Physicians, six House Surgeons, two Obstetric and Gynæcological House Surgeons, and two House Surgeons to the Special Departments are appointed annually. The large proportion of resident appointments to the number of students makes it probable that a student of ordinary ability will be able to obtain one of these appointments.

The following appointments are open to students after they have held resident appointments: Resident Medical Officer, at a salary of £400 per annum: Registrar to the Medical, Surgical, Obstetrical and Ear, Nose, and Throat Departments, at £150 per annum.

By an agreement with the University of London the School sends its Primary and Intermediate Students to receive their lectures and practical work at King's College, which is situated within four minutes' walk.

Final studies are taken in the school and hospital, where systematic lectures, demonstrations, and tutorial classes are arranged to cover all the subjects necessary for qualifying examinations. Departments are also available for other final subjects of Materia Medica and Operative Surgery.

An Institute of Pathology with a whole-time staff of scientific workers and fully equipped laboratories has been established. Students receive their training in Preventive Medicine, Pathology, Bacteriology, and Biochemistry here, and are encouraged to undertake research. Special facilities are available for post-graduate research and study.

The course in Ophthalmology is given in the Royal Westminster Ophthalmic Hospital. Special demonstrations are arranged for Post-graduates.

One Epsom School Scholarship, two Oxford and Cambridge Scholarships, and one Scholarship in Anatomy and Physiology open to students of King's College, are offered for competition each year. In addition there are a number of Exhibitions.

The Museum contains over 4000 specimens, including a notable collection of over 800 gynæcological specimens, the Cuthbert Lockyer Collection.

The social comfort and convenience of students are met by library, reading, and smoking-rooms, refreshment-room, in a Students' Club. The Club, which is under the control of a committee of students, provides needful athletic recreation, and includes also a medical society.

Further information may be obtained on application to the Dean, Dr. F. H. Young.

ST. GEORGE'S HOSPITAL.—This hospital has a service of 436 beds, of which 180 are allotted to surgical, 150 to medical cases, and 100 are at the Convalescent Hospital at Wimbledon. There are all the usual special clinical departments. One ward is set apart for Diseases Peculiar to Women, and there is a Maternity Ward of 11 beds. Children's beds are placed in the women's wards. There are two ophthalmic wards.

Twelve house physicians, 12 house surgeons, and 12 casualty officers are appointed annually. Special attention is directed to the following paid appointments, among others, which are open to students after they have held house office:—Resident Assistant Physician and Resident Assistant Surgeon, at £350 per annum each; Medical Officer to the Atkinson-Morley Convalescent Hospital, at £300 per annum; Medical Registrarship at £200 per annum, Surgical Registrarship at £200; Assistant Curatorship of the Museum at £100; Obstetric Assistantship (Resident) at £50; the post of Resident Anæsthetist at £100; the posts (3) of Junior Anæsthetists, each at £30.

Entrance Scholarships and Endowed Prizes of a total value of £700 are awarded annually; a detailed list is placed below. The entire teaching and laboratories are now devoted to purely clinical subjects, and arrangements have been made with the authorities of King's College for students who enter the first, second, or third year of the curriculum as students of St. George's to carry out the necessary courses of instruction at that College. Students then complete their course, without payment of any entrance fee, in a school entirely devoted to clinical work.

Scholarships and Prizes.—At this school five entrance scholarships are given, the money value and the subjects of examination being as follows: (*a*) and (*b*) two William Brown Exhibitions, £120 and £80 respectively; (*c*) and (*d*) two University Entrance Scholarships, 90 guineas and £70 respectively; (*e*) Devitt-Pendlebury Scholarship, £50, Anatomy and Physiology, except in the case of (*c*), subject of examination for which is General Pathology.

This year, in addition to these Scholarships, Exhibitions, each of the value of £40 and up to six in number, will be awarded to candidates of approved merit in the Entrance Scholarships Examination. The others are as follows: (*f*) Allingham Scholarship in Surgery for Students qualified not more than two years, £85; (*g*) and (*h*) two Brackenbury Prizes, one in Medicine and one in Surgery, £33 each, open to students of not more than five years' standing; (*i*) H. C. Johnson Memorial Prize, £19, Practical Anatomy; (*j*) Pollock Prize, £23, Physiology, Physiological Chemistry, and Histology; (*k*) Clarke Prize, £5; (*l*) Thompson Medal, £9, Clinical Reports; (*m*) Brodie Prize, £8, Clinical Reports; (*n*) Webb Prize, open to perpetual pupils, £34, Bacteriology; (*o*) Sir Francis Laking Memorial Prize, £65, open to students having registrable qualifications.

The First Examination for Medical Degrees (*Inorganic Chemistry, Physics, including Mechanics, and General Biology*) will take place twice in each year, commencing on the Monday following Dec. 7th and on the first Monday in July. It must be passed not less than nine months after matriculation.

The Second Examination for Medical Degrees (*Part I.*) *: Organic Chemistry.*—This examination will take place twice in each year, commencing on the Thursday following the second Monday in March and on the Thursday following the first Monday in July. No candidate will be admitted to this examination until he has completed the First Examination.

The Second Examination for Medical Degrees (*Part II.*) takes place twice in every year, commencing on the Tuesday following the third Monday in March and on the Tuesday following the first Monday in July. No candidate shall be admitted to the examination unless he has passed the First Examination for Medical Degrees at least 18 months previously, and has passed Part I. of the Second Examination for Medical Degrees.

The Third or M.B., B.S. Examination.—The M.B., B.S. examination takes place twice in each year, commencing on the second Monday in November and on the first Monday in May. No candidate will be admitted to this examination unless he has completed the Second Examination for Medical Degrees, together with a course of study summarised below, nor within three years from the date of passing the Second Examination, Part II., in Anatomy and Physiology. The course of study comprises introductory course in (1) Clinical Medicine; (2) Clinical Surgery; and (3) Clinical Pathology; (4) Experience as Clinical Clerk; (5) Clinical Medicine; (6) (*a*) Fevers, (*b*) Children's Diseases, (*c*) Venereal Diseases, (*d*) Mental Diseases (at a recognised Asylum), (*e*) Dermatology, (*f*) Vaccination, (*g*) Materia Medica and Pharmacy; (7) Experience as a Surgical Dresser; (8) Clinical Surgery; (9) Ophthalmology; (10) Oto-Rhino-Laryngology; (11) (*a*) Operative Surgery, (*b*) Applied Anatomy, (*c*) Administration of Anæsthetics, (*d*) Dental Surgery, (*e*) Orthopædic Surgery; (*f*) Mechano-therapeutics; (12) Obstetrics and Gynæcology; (13) Lying-in Hospital; (14) The conduct of at least 20 Labours; (15) Antenatal Clinic; (16) Experience as a Clinical Clerk in Gynæcological Work; (17) General Pathology, Morbid Anatomy, Bacteriology, and Chemical Pathology; (18) Work in the Post-Mortem Room; (19) Clinical Laboratory; (20) Forensic Medicine; (21) Hygiene. He must have attended the Medical and Surgical Practice of a recognised hospital for two years, and have held the posts of clinical clerk and surgical dresser for periods of six months each. Candidates will be examined in Medicine, Pathology, Forensic Medicine and Hygiene, Surgery, Obstetrics and Gynæcology. The subjects may be divided into two groups—namely: (1) Medicine, Pathology, Forensic Medicine, and Hygiene; and (2) Surgery, Obstetrics, and Gynæcology. These groups may be taken either separately or together. Bachelors of Medicine who graduated before May, 1904, may obtain the B.S. by passing the Surgical part of the M.B., B.S.

Doctor of Medicine.—The examination for this degree takes place twice in each year, commencing on the second Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches—namely: (1) Medicine; (2) Pathology; (3) Psychological Medicine; (4) Midwifery and Diseases of Women; (5) State Medicine; and (6) Tropical Medicine. Any candidate for the degree of M.D. (except in branch 5) may transmit to the Registrar a thesis for approval and may be exempted from a part or from the whole of the written examination.

Master of Surgery.—The examination for the degree of Master of Surgery takes place twice in each year: (1) Surgery; (2) Dental Surgery; (3) Ophthalmology; (4) Laryngology, Otology, and Rhinology. A thesis may be submitted as for M.D.

Bachelor of Pharmacy.—The course extends over three years.

Full details of the prescribed curricula can be obtained free on application to the Academic Registrar, University of London, South Kensington, S.W. 7.

MEDICAL SCHOOLS OF THE UNIVERSITY OF LONDON.[1]

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.—The hospital contains 757 beds, of which 687 are for patients in the hospital at Smithfield and 70 at the Alexandra Hospital, Swanley. Special departments have been organised for Diseases of Women and Children, the Eye, Ear, Larynx, and Skin, as well as for Orthopædic and Dental Surgery, and for Electro-therapeutics and X Ray work. Whole-time Clinical Units under Professors of Medicine and Surgery have been established.

Ten house physicians and ten house surgeons are appointed annually, are provided with rooms and board, and receive £80 a year as salary. A resident midwifery assistant, an ophthalmic house surgeon, and a house surgeon for diseases of the throat, nose, and ear, and a house surgeon for orthopædic surgery are appointed every six months, and are provided with rooms and board and receive a salary of £80 a year. Three resident administrators of anæsthetics are appointed, the senior for one year at a salary of £150, and two juniors for six months with a salary at the rate of £80 per annum with board and rooms. An extern midwifery assistant is appointed every three months, and receives a salary of £80 a year. The clinical clerks, the obstetric clerks, the clerks to the medical out-patients, the dressers to the surgical in-patients and to the out-patients, and the dressers in the special departments are chosen from the students. A residential College is attached to the hospital.

There are quarters for the resident staff, casualty, medical, surgical, and special out-patient departments, casualty wards, dispensary, and clinical lecture theatre. There is a chemical laboratory attached to the College as well as a laboratory devoted to instruction in Public Health. A block is devoted to Pathology, and contains the post-mortem room as well as extensive laboratories for bacteriology, clinical pathology, and pathological chemistry. *The Medical College Buildings* include three large lecture theatres, a large dissecting room, laboratories for chemistry, biology, morbid anatomy and histology, and public health, as well as a spacious library (containing 14,500 volumes), a well-appointed museum of anatomy, physiology, comparative anatomy, materia medica, *The patho-* botany, and pathological anatomy. logical museum is complete. A new block in Giltspur-street has recently been acquired and has been fitted up as lecture theatres and laboratories for physics, chemical physiology, experimental physiology, histology, and pharmacology.

Special Classes for the Primary and Final F.R.C.S. *Instruction in Preliminary* are held twice yearly. *Science* is given to University of London students in the year. chemistry, biology, and physics throughout the Clinical Facilities for research work are afforded in the other Units and Laboratories of pathological and departments. *A Vacation Post-graduate Course*, adapted to general practitioners, is given annually.

Scholarships given in aid of Medical Study.—For five of the Scholarships and the Exhibition—namely, (*a*), (*b*), two Entrance Scholarships in Science of the respective values of £75 and £100; (*c*) Entrance the firm in elementary medicine and surgery, and who assists the honorary members of the firm in the preparation of their demonstrations. In the department of Obstetrics and Gynæcology there are two assistants and two resident accoucheurs. Special courses of lectures and demonstrations are arranged in Medicine and Surgery and their ancillary subjects. Opportunities for research are provided under the supervision of the staff.

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[1] Of these schools that of the Royal Free Hospital is reserved for women; University College admits men and women to the whole course, the number of women being limited; King's College admits men and women to the Intermediate subjects; the remainder admit men only.

Owing to the large number of patients more appointments are open to students before and after qualification than at any other hospital. Holders of resident appointments have free board. Special classes are held for the examinations of the University of London, for the Fellowship of the Royal College of Surgeons, for the Membership of the Royal College of Physicians, and for other higher examinations. Special entries for medical and surgical practice can be made.

A Clinical Unit in Medicine, under the charge of a whole-time director, provides for the more elaborate methods of diagnosis and treatment, and takes a leading part in the initiation and coördination of medical research. The director has an assistant director, two assistants, and two house physicians.

Scholarships and Prizes.—The following is a list of the Scholarships and Prizes :—Price Scholarship £100, and one Entrance Scholarship of £50, subjects of First Medical Examination at the University of London; Epsom College Scholarship, free education, subjects of First Medical Examination as above; Price Scholarship, open to students of Oxford and Cambridge Universities, (1) £100, Pathology; (2) £75, Human Anatomy and Physiology; Buxton Prize, £40, subjects of Anatomy and Physiology; three Prizes for Clinical Work, £20 each, Medicine, Surgery, and Obstetrics and Gynæcology; Sutton Prize, £20, Pathology; Duckworth Nelson Prize, biennial, £10, Practical Medicine, and Surgery; Letheby Prizes (2), £25, Chemistry and Chemical Pathology; four Dressers' Prizes, amounting to £20, zeal, efficiency, and knowledge of Elementary Clinical Surgery; Hutchinson Prize, triennial, £60, Clinical Surgery; Treves Prize, £15, Clinical Surgery; two Practical Anatomy Prizes, £6 and £4 respectively; Andrew Clark Prize, £14, Clinical Medicine and Pathology; T. A. M. Ross (Prox. Acc.) Prize, £10 10s., Clinical Medicine and Pathology; James Anderson Prizes (4), £20, Elementary Clinical Medicine; Arnold Thompson Prize, £15, Diseases of Children; K. E. D. Payne Prize, Research Scholarship, £20, Pathology; and Liddle Prize, triennial, £120.

Medical Research Funds.—Funds to the value of over £90,000 permit of financial assistance being given to students and graduates engaged in Medical Research.

Two Residential Hostels are provided for students. The recent additions to the hospital and college buildings include the Dunn Clinical Laboratories. The Bearsted Clinical Theatre, the Bernhard Baron Institute of Pathology, and a hostel for 40 resident medical officers. The Union Athletic Ground, 13 acres, is within easy reach of the hospital.

Dean: Prof. William Wright.

ST. MARY'S HOSPITAL.—The Hospital and Medical School have on one side a poor district of 500,000 persons, and on the other side the residential districts of Kensington and Bayswater. The hospital contains 350 beds and structural additions during the past year have added two new operating theatres. By a scheme of affiliation, for teaching purposes, of certain neighbouring hospitals, the teaching facilities extend over 1000 beds. The Medical School provides complete courses of instruction, and students can join at once on passing a Preliminary Examination in Arts. Terms begin in October, January, and April.

Clinical Units in Medicine and Surgery were established in 1920. Lying-in beds have recently been added, and, in addition to this, arrangements have been made by which all students take out a short course of instruction in Practical Midwifery at Queen Charlotte's Hospital without additional fee.

Students specially interested in Pathology and Bacteriology have singular advantages at St. Mary's. The institute comprises seven special departments, the whole being under the personal direction of Sir Almroth Wright. Certain Research Scholarships of £200 each are awarded annually to students working in the departments of the institute; and research beds have been instituted. Clerkships in Pathology, Bacteriology, and Chemical Pathology, lasting for a period of three months, are open to students of the fifth year, and enable them to carry out the Pathological and Bacteriological investigations of the wards, and learn the necessary technique under supervision. Seventy-two of these posts are available annually. Numerous appointments are open to newly qualified members of the Medical School, including ten salaried posts with salaries varying from £200 to £750 per annum.

Entrance Scholarships.—Two Entrance Scholarships of the value of £210 each are awarded annually, by nomination in July, the Geraldine Harmsworth Scholarship, £200, and one or more University Scholarships of £200 are awarded in July.

The Athletic ground (10 acres) is situated at Wembley and can be reached in 20 minutes by a constant service of trains. A large pavilion has recently been added.

For further information apply to the Dean of the Medical School.

MIDDLESEX HOSPITAL.—The hospital contains over 450 beds, with special wards for Cancer, Maternity and Gynæcological and Ophthalmological cases, and for Diseases of Children. Other special departments include those for Diseases of the Eye, Ear, Nose and Throat, and Skin; Nervous diseases, Orthopædic cases, Diseases of the Rectum and Venereal Diseases. There is also an Electrotherapeutic department. The Cancer Charity, containing 92 beds and Special Investigation Laboratories, offers unrivalled opportunities for the study of Cancer, both in its clinical and pathological aspects. In the Electrotherapeutic Department, students obtain instruction in the Treatment of Lupus and Cancer by the X ray method of treatment.

All appointments are made without fee of any kind, and the following are appointed at intervals annually: six house physicians, eight house surgeons, two obstetric and gynæcological house surgeons, two casualty medical officers, two casualty surgical officers, four resident anæsthetists, and four resident officers to the special departments. The medical and surgical casualty officers are appointed twice a year. Nine registrars are appointed annually. Non-resident qualified clinical assistants are appointed to assist in the various out-patient departments. Clinical clerks and surgical dressers are also appointed in every department.

The Medical School, which includes the Bland-Sutton Institute of Pathology, the Courtauld Institute of Biochemistry, and the Cancer Research Laboratories is fully equipped for the theoretical and practical teaching of all the subjects of the medical curriculum, and for the Diplomas in Public Health, for which two courses are held yearly. Ample laboratory and class-room accommodation is provided. The teaching staff includes 6 Professors, 32 recognised Teachers, 10 Demonstrators, 4 tutors. The Bland-Sutton Institute of Pathology is completely equipped for routine hospital investigations, teaching and research work, and contains a lecture theatre, large pathological, bacteriological, and clinical laboratories, also smaller laboratories for individual research work. A well-equipped Anatomical and Pathological Museum and Reference Library offer every facility.

Other features of interest are: the course in Medical Radiology and Electrology, under the direction of the "Joel" Professor of Physics; D.P.H. course, under the direction of Dr. Charles Porter, M.O.H., St. Marylebone, Prof. J. McIntosh, and Prof. W. B.

The St. George's Hospital Club, with smoking- and luncheon-rooms is on the hospital premises and an athletic ground at Wimbledon, is an amalgamation of the Hunterian Society, the *Gazette*, and the Rugby football, cricket, lawn tennis, boxing, rifle, and golf clubs. Students have the advantage of a library of medical and scientific books which is kept up to date.

Further information may be obtained from the Dean of the Medical School, Dr. A. Feiling.

GUY'S HOSPITAL.—This hospital contains 642 beds. The whole of the medical school has been rebuilt within recent years. It provides ample accommodation, with modern equipment, for all the non-clinical subjects of the medical curriculum.

The following special departments are attached to the hospital: Departments of ophthalmology, laryngology, gynæcology, diseases of children, diseases of the nervous system, dermatology, otology, actino-therapeutics, anæsthetics, dentistry, orthopædics, vaccine, tuberculosis, genito-urinary and venereal diseases, Salomon's Welfare Centre (for Maternity and Children). Dresserships and clerkships in the various special departments are held by students in turn.

There is a Venereal Clinic, in accordance with the Scheme of the Local Government Board and London County Council. Lectures and clinical instruction are given, to which Medical Students and Practitioners are admitted without fee.

House physicians, house surgeons, out-patient officers, assistant house surgeons, obstetric residents, house surgeons in the departments of ophthalmology, laryngology, and genito-urinary diseases, house physicians in the department for diseases of children, and clinical assistants are appointed from among recently qualified students according to merit.

Scholarships.—Six entrance scholarships are awarded annually as follows:—(*a*) one War Memorial scholarship, of the value of £200, to be awarded alternately in Arts and Science (next award, June or July, 1930 in Science); (*b*) one Open Arts Scholarship of £100 for students under 19 years of age; candidates may offer themselves in either of the following groups: (1) English and any two of the following—viz., Latin, Greek, or Mathematics; (2) English and any two of the following—viz., French, German, and Mathematics; (*c*) one Open Junior Science scholarship for students under 20 years, £100; subjects, any three of the following: Inorganic Chemistry, Physics, Biology, and Mathematics; (*d*) a confined Junior Science scholarship of the value of £100 is offered for competition, annually in June or July, to candidates who have attended the Preliminary Science Classes at this School; (*e*) two open Senior Science scholarships: (1) a War Memorial scholarship of the value of £100, awarded annually in September; (2) an open scholarship of the value of £80, awarded annually in September, for students who have completed the curriculum for, or passed the examinations in, Anatomy and Physiology for a medical degree in any University of the British Empire, and who, during the nine months immediately preceding the Scholarship examination, have not entered as students in any Metropolitan Medical School other than Guy's; subjects, any two of the following:—Anatomy, Physiology, Organic Chemistry and Pharmacology, General Pathology.

Within the grounds of the hospital are situated the residential college, with accommodation for 35 students, the students' club, with reading, smoking, luncheon, and dining-rooms, a fives court, and swimming bath. The athletic ground and club house is situated at Honor Oak Park, and can be reached in 15 minutes from the hospital.

Further information can be obtained from the Dean of the Medical School, Prof. T. B. Johnston.

KING'S COLLEGE HOSPITAL.—The final subjects in the curriculum are taught at the Medical School of King's College Hospital, which is situated at Denmark Hill, S.E. 5.

The hospital has 400 beds, and provision will ultimately be made for 600. There are special departments for Bacteriology, Children, Clinical Pathology, Dermatology, Gynæcology and Obstetrics, Laryngology, Massage, Neurology, Odontology, Ophthalmology, Orthopædics, Otology, Physical Treatment, Psychological Medicine, Radiology, Rhinology, and Urology, each in charge of a specialist and his staff. Clinics are also held in applied pharmacology, cardiology, and medical chemistry.

Appointments.—The appointments open to students are those of clinical assistant to the special departments; medical, surgical, obstetric, and pathological tutorships; resident casualty officers, house physicians and house surgeons; resident anæsthetist; resident radiologist; bacteriologist; clinical pathologist; pathological, medical, surgical, and obstetrical registrarships. Sixteen resident medical and surgical officers are appointed half-yearly.

Scholarships and Registrarships (those in connexion with King's College have already been enumerated).—Scholarships of the total value of £1095 are awarded annually. These include (*a*) Medical Entrance Scholarships—Science, £50; Anatomy and Physiology, £50; Pathology, £75; (*b*) two Burney Yeo Entrance Scholarships, £80 each, open to students of Oxford and Cambridge on the recommendation of the Regius Professors; (*c*) two Raymond Gooch Scholarships, £120 each, open to students of British Universities on certain conditions; (*d*) an Epsom College Scholarship, value £50 at least, offered annually to a student of Epsom College who has taken the first part of the courses for Medical Degrees at the Universities of Oxford, Cambridge, or London; (*e*) a Seaman Scholarship, £50 a year for a period not exceeding five years, restricted to the sons of poor clergymen of the Church of England; (*f*) Senior Scholarship (Clinical Studies), £40. The holders of the Warneford and Sambrooke Scholarships awarded by King's College are required to take the subjects of the preliminary and intermediate examinations at King's College, and the final subjects at King's College Hospital. Three Sambrooke Registrarships, open to matriculated stidents who have filled certain appointments in hospital.

Prizes.—Tanner Prize, £10, Obstetrics and Diseases of Women; Todd Prize, £4 4*s.* and medal, Clinical Medicine; Burridge Prize, £4 4*s.*, Forensic Medicine; Jocelyn Almond Prize, £5 5*s.*, Diseases of Children; Wallis Prize, £10, History of Dentistry; 13 Class Prizes, £3 each.

The King's College Hospital Clubs and Societies Union consists of the Listerian and Musical Societies, the Students' Common Rooms, and the various athletic and sports clubs. The athletic ground, over six acres in extent, is on Dog Kennel Hill, about ten minutes' walk from the hospital. There are also Tennis Courts in the grounds of the Hospital and of "The Platanes"—a hall of residence for students belonging to the hospital.

The Calendar of the School will be sent on application to either of the following: Dr. H. Willoughby Lyle, Dean; Mr. S. C. Ranner, Secretary of the Medical School.

LONDON HOSPITAL.—The hospital, with its Medical College and Dental School, is situated in Mile End-road, and contains 837 beds. There are special departments for diseases of the Eye, Ear, Nose and Throat, Skin, Teeth, and Pediatric, Orthopædic, Venereal, Radiological, Electro- and Physico-therapeutical and Inoculation Departments.

To each medical and surgical firm throughout the hospital there is attached a First Assistant, who is responsible for instructing the clerks or dressers of

30 residents and students), the extension to the Nurses' Home, and new research laboratories for the Medical School are now finished and in full occupation. Twelve women students are admitted annually.

Those who are desirous of carrying out original research in Pathology, including Morbid Anatomy, Bacteriology, Experimental Pathology, and Chemical Pathology, are admitted to work in the laboratories of the school by the Professor of Pathology, and under certain conditions can receive grants from the Charles Graham Medical Research Fund. A special course of instruction is given in conjunction with University College for preparation for the examinations for Diplomas in Public Health of the various universities and examining bodies. In the Dental School in Great Portland-street, formerly known as the National Dental Hospital, there is afforded the opportunity for attending lectures and practical instruction in diseases of the mouth and teeth.

Appointments.—Clerkships and dresserships to the physicians, surgeons, anæsthetist, and pathologist are allotted amongst the students of the hospital. Maternity students are appointed each month and reside in the Students' House connected with the Medical School and Hospital. Fourteen house physicians, six house surgeons, ten obstetric assistants, two house surgeons to the Royal Ear Hospital (of the total number of resident officers not more than three may be held by women students at any one time) are selected annually by examination from among the senior students who have a medical qualification. All house officers reside free in the hospital. In addition to these posts there are certain special appointments which are vacant from time to time and are filled by senior students of the hospital: Resident Medical Officer, Surgical Registrar, Medical Registrar, Obstetric Registrar, Harker-Smith Cancer Registrar, Ophthalmic Registrar, Registrar to the Royal Ear Hospital, Casualty Medical Officer and a Casualty Surgical Officer, Assistants in Ear and Throat, Skin and Venereal Diseases Departments, and House Anæsthetist.

Scholarships and Prizes (those in connexion with University College have already been enumerated).—At this School the first two Scholarships (*a*) and (*b*) entitle the holder to a complete course at University College and University College Hospital Medical School; the second two (*c*) and (*d*) entitle to a final course at the Medical School. The money value and subjects of examination are as follows:—(*a*) Entrance Scholarship, Bucknill, 135 guineas, Chemistry, Physics, Botany, and Zoology; (*b*) Epsom Free Medical Scholarship, subjects of Preliminary Scientific Examination and Nomination by Epsom College; (*c*) and (*d*) two Goldsmid Entrance Exhibitions 112 guineas each, Anatomy or Physiology, or General Pathology; (*e*) Graham Scholarship in Pathology, £300 per annum for two years, awarded by the Senate of the University of London; (*f*) Atkinson Morley Scholarship, tenable for three years, £45 per annum, Surgery; (*g*) Atchison Scholarship, tenable for two years, £55 per annum, General Proficiency in Medical Studies; (*h*) Magrath Clinical Scholarship, about £150, Clinical Cases; (*i*) Percival Alleyn Scholarship, about £75, Surgery; (*j*) Filliter Exhibition, £30, Pathology; (*k*) Erichsen Prize, £10 10s., Practical Surgery; (*l*) two Senior and two Junior Fellowes Clinical Medals for Clinical Medicine; (*m*) two Liston Gold Medals for Clinical Surgery; (*n*) Alexander Bruce Gold Medal for Pathology and Surgery; and (*o*) Tuke Silver and Bronze Medals for Pathology, (*p*) Radcliffe Crocker Travelling Scholarship for Dermatology. (*q*) Leslie Pearce Gould Travelling Scholarship for Surgery.

The *Museum of Pathological Anatomy* is open for study daily, and microscopic sections of most of the specimens have been prepared and are available for the use of students on application to the Curator. The Anatomical Museum of the University of London, University College, is open to all students of University College Hospital and Medical School on the recommendation of the School Committee. The Medical Library, open daily to every student of the School, contains about 20,000 works on medical subjects, including all the current text-books and works of reference required for study or research.

The Medical Society of University College Hospital Medical School exists for the dual purpose (1) of promoting the study of medical and surgical science, and (2) of promoting social intercourse among its members. All male students of the Medical School are required to become members. Meetings are held once a fortnight for the purpose of discussing subjects connected with the study of medicine. In its social aspect the society includes various athletic clubs and superintends the gymnasium and squash racquet court in the Medical School, and the Athletic Ground at Perivale.

University College Hall, Ealing, is recognised by the authorities as a residential hostel. The Students' House in University-street contains large and comfortable rooms. The Maternity Students occupy them on payment of a moderate charge.

Full information can be obtained from the Dean of the School.

WESTMINSTER HOSPITAL.—The Hospital contains 240 beds. By a scheme for the concentration of the teaching of the preliminary and intermediate subjects of the curriculum, which has the support of the London University, an arrangement has been made by the Westminster School for the teaching of these subjects at King's College. Students, however, may join the Westminster Medical School as formerly and may compete for Entrance Scholarships as heretofore. There are separate departments for Diseases of the Eye, Skin, Teeth, Ear, Nose, and Throat, for Orthopædic practice, for Diseases of Women, for Diseases of Children, for Radiography, for Venereal Diseases, and for Massage, Electrical and Light Treatment. The Anatomical, Pathological, and Materia Medica Museums are open to all students of the school.

The usual registrarships and house appointments are open to students.

Scholarships and Prizes.—The following Entrance Scholarships are offered for competition: Winter Session: Two Scholarships in Anatomy and Physiology, £75 each. Summer Session: Two Scholarships in Anatomy and Physiology, £75 each. A certain number of Scholarships have been allotted to Universities of England, Wales, and the Colonies, and to Public Schools. These Scholarships are awarded entirely on the nomination of the principal of the university or school. During the period of study the following prizes may be competed for: Sturges Prize in Clinical Medicine, about £6, Reports on Cases; Clinical Surgery Prize, £5, Reports on Cases; Chadwick Prize, £21 in books or instruments—Medicine and Surgery, including Pathology and Applied Anatomy and Physiology; Frederic Bird Medal and Prize, open to Fourth-year Students, £14 in medal and books or instruments—Midwifery, Diseases of Women, Medicine, Pathology, Forensic Medicine and Bacteriology, and Public Health and Toxicology; Abrahams Prize in Clinical Pathology, 5 guineas, a Paper and Tests in Practical Work; Alfred Hughes Memorial Prize, open to Second-year Students, about £5 in books or instruments—Anatomy; Huxley Memorial Prize, 3 guineas in books or cash, open to Second-year Students—Physiology; Carter Gold Medal and Prize for Botany, open to Students of not more than three years' attendance, gold medal and books of the joint value of £15; Jelf Medal awarded to Third-year Students; Second-year Scholarship £20, Elementary Anatomy, Physiology, Histology, and Organic Chemistry; Daniell Scholarship, £40, Chemistry; Rabbeth Scholarships open to First-year Students, one of £30 and one of £15; Class Examinations in the Preliminary Scientific Course.

The Athletic Grounds are situated in Tooting and are reached in 20 minutes from the hospital.

Inquiries should be addressed to the Dean of the Medical School.

Tuck. A primary F.R.C.S. course is held twice yearly, and special classes to prepare students for the Intermediate Examinations of the Universities.

Scholarships and Prizes.—Two Entrance Scholarships, value £100 each, and two University Scholarships, value £90 and £60, are awarded annually in September. The successful candidates are required to become general students of the school. A Freer Lucas Scholarship is awarded annually on the nomination of the Headmaster of Epsom College. There are also two Broderip Scholarships, value £60 and £40 respectively; the Lyell Gold Medal and Scholarship, value £55 5*s.*; the John Murray Medal and Scholarship, value £25 (awarded every third year); the Freeman Scholarship, value £30; the Hetley Clinical Prize, value £25; the Leopold Hudson Prize, value 11 guineas; and the Second Year's Exhibition, value 10 guineas. There are also numerous class prizes.

The Amalgamated Students' Club includes the following: Medical Society, Common Room Society, Musical Society, cricket club, football clubs, athletic club, rowing club, chess club, lawn tennis club, and hockey club. There are a restaurant and gymnasium in the school buildings, and large athletic grounds at N. Wembley, with new pavilion.

For further particulars apply to the Dean or the Secretary of the Medical School.

ST. THOMAS'S HOSPITAL.—This Hospital contains 644 beds. There are special departments for the treatment of women, children, diseases of the eye, ear, nose and throat, skin, teeth, and for orthopædics. Nervous and mental diseases are treated in special departments. An electrocardiograph has been installed for the investigation of diseases of the heart. The Tuberculosis Department forms a part of the Lambeth scheme for treatment of patients and for instruction. The Venereal Department has been established as part of the London County Council scheme. Departments for Radiology, Electrotherapy, Phototherapy, Massage and Remedial Physical Exercises are also special features. A speech clinic has been inaugurated in connexion with the Children's Department. Exceptional facilities are offered in the hospital laboratories for the study of General Pathology, Clinical Pathology, Chemical Pathology, and of Treatment by Serums and Vaccines. Surgical operations take place in the main theatres every day, except Saturdays, at 2 P.M. Clinical teaching in the wards, out-patients' and special departments, is available every day of the week. Clinical lectures are delivered every Wednesday during the sessions. A Clinical Unit in Medicine has been established.

All appointments in the hospital are open to students without extra fee. Clinical clerks and dressers for in- and out-patients are selected from students who have completed their third years' work. Every student acts as clerk in the post-mortem room and in one of the pathological laboratories, takes his turn on maternity duty under proper supervision in the maternity ward and district, thus obviating any necessity for seeking instruction elsewhere. Students are instructed in the administration of anæsthetics by the hospital anæsthetists.

The arrangements are made to meet the requirements of all the Examining Bodies. Special classes are held for the examinations at the University of London and for the First and Final Fellowship Examinations of the Royal College of Surgeons of England. Tutorial classes in all subjects precede the various examinations. The hospital is easily accessible from all parts.

Appointments.—A Resident Assistant Physician and a Resident Assistant Surgeon, salary £225 each per annum, and a Resident Anæsthetist, salary £200 per annum, are appointed annually. Two Hospital Registrars, Medical and Surgical, at an annual salary of £250 each are appointed yearly. The tenure of these offices may be renewed for a term not exceeding two years. A Pathological Registrar to the Department of Obstetrics and Gynæcology (at an annual salary of £250), an Ophthalmic Registrar (at an annual salary of £50), and an Orthopædic Registrar (unpaid) are appointed yearly. Two Senior Resident Casualty Officers (Medical and Surgical) are appointed yearly. Eight Resident Casualty Officers and Anæsthetists are appointed every six months. Seven House Physicians (including two Obstetric House Physicians, and one House Physician to the Department of Diseases of Children), nine House Surgeons (including two Ophthalmic House Surgeons, one Orthopædic House Surgeon, and two House Surgeons to the Ear, Nose and Throat Department) are appointed every six months. Clinical Assistants in the Special Departments are appointed every three months, and hold office for six months if recommended for re-election. There are three Assistants in the Department of Pathology; the Senior receives £600 a year, and the two Juniors £450 each.

Scholarships and Prizes.—At this school there are five Entrance Scholarships—namely, two in Arts, equivalent to the tuition fees for the first year of study; two in Natural Science, of the value of £150 and £60 respectively; and the University Scholarship of £100 in any two of the following: Anatomy, Physiology, Pathology, Chemistry. The value of all entrance scholarships must be taken out in tuition fees. The money value and subjects of examination of the remainder are as follows: (*a*) William Tite Scholarship for second-year students, £25; (*b*) and (*c*) Musgrove Scholarship or (alternately) Peacock Scholarship, each for third-year students and tenable for two years, £3[illegible] each; (*d*) Mead Medal, Medicine, Pathology and Hygiene; (*e*) Wainwright Prize, Medicine; (*f*) Toller Prize, Medicine; (*g*) Cheselden Medal, Surgery and Anatomy; (*h*) Clutton Memorial Medal in Clinical Surgery, biennial; (*i*) Beaney Scholarship, £5[illegible], biennially, Surgery and Surgical Pathology; (*j*) Solly Medal and Prize, biennial, Reports of Cases; (*k*) Sutton Sams Prize, biennial, Report of Cases; (*l*) Bristowe Medal, Pathology and Morbid Anatomy; (*m*) Hadden Prize, Pathology and Morbid Anatomy; (*n*) Grainger Testimonial Prize, £31 10*s.*, Anatomy and Physiology; (*o*) Louis Jenner Research Scholarship, tenable for two years, £60 annually, Pathology; *(p) School Council Research Scholarship,* £250 per annum, tenable for two years; (*q*) John and Temple Research Fellowship, tenable for two years, £450, Children.

St. Thomas's House, the New Students' Club recently opened, comprises spacious dining-, smoking-, and reading-rooms, and accommodation for some 60 resident students. There is no occasion for students to leave the hospital premises during working hours.

Further information may be obtained from the Medical Secretary of the School, St. Thomas's Hospital.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—The final subjects in the curriculum are taught at the Medical School of the hospital, which has 526 beds, including 74 in the new obstetric hospital. The course of instruction is suitable for the examinations at the *Universities of Oxford*, Cambridge, Durham, and other British Universities, and for the medical education required by the Examining Board in England and the Society of Apothecaries. Clinical Units in Medicine, Surgery, and Obstetrics and Gynæcology are now in operation. The whole-time Directors of the Units are concerned with the organisation of the teaching generally, but the honorary staff are responsible for the largest share of the teaching in the wards and Out-patient Department of the hospital. The department of otology, rhinology, and laryngology (*the Royal Ear* Hospital) has been provided with a separate building in Hunter-street, adjacent to the obstetric hospital. It contains 39 beds, including eight private wards for *patients of limited means.* The hospital is equipped with all modern appliances for investigation. The new buildings of the Obstetric Hospital of 74 beds (rendered possible by the *Rockefeller Benefaction*), the new Residents' House (with accommodation for date must submit to the Professor of Surgery the course of study he proposes to follow, and this course must be approved by the Board of the Faculty of Medicine. One year shall be devoted mainly to work in the departments of Anatomy, Physiology, Pathology, and Bacteriology, and the candidate must submit evidence of having so worked. Not less than six months of another year must be spent as resident surgeon in a recognised teaching hospital, and the rest of the year in the study of surgery in a recognised medical centre. Not less than six months of one of the three years must be spent in surgical study abroad.

Candidates for any of the above degrees, diplomas, or licence must give at least 28 days' notice to the Secretary of Examinations, University of Durham College of Medicine, Newcastle-upon-Tyne. In the case of the M.D. (essay) examination candidates must send in their essays before April 1st.

Scholarships and Prizes.—The following are awarded:—University of Durham Entrance Scholarship, £25 a year for four years; Pears' Entrance Scholarship, £40 a year for three years (awarded every third year; Heath Entrance Scholarship (from Kepier Grammar School), £60 (renewable); Province of Durham Masonic (Entrance) Scholarship, £60 (renewable); Heath Scholarship for Surgery, £200, available every second year; Rutherford Morison Surgical Scholarship, £180, available every third year.

The following Scholarships are tenable for one year, namely:—Tulloch Scholarship for Elementary Biology and Organic Chemistry, £20; Dickinson Scholarship for Medicine, Surgery, Midwifery, and Pathology; Gold Medal and £20; Charlton Scholarship for Medicine, £25; Gibb Scholarship for Pathology, £28; Luke Armstrong Scholarship for Comparative Pathology, £25; Stephen Scott Scholarship for Surgery, £40; Philipson Scholarships for highest marks in Final M.B., B.S. Examinations, two of £48 each; Goyder Memorial Scholarship for Clinical Medicine and Clinical Surgery, interest on £325; Gibson Prize for Midwifery and Diseases of Women and Children, £10; Turnbull Prize and Silver Medal for Surface Anatomy; and Outterson Wood Prize for Psychological Medicine, £10; Sewell Memorial Prize and Silver Medal for Clinical Pathology.

For further information apply to the Dean of the College.

COLLEGE OF MEDICINE, Newcastle-upon-Tyne.—Hospital practice is carried out at the Royal Victoria Infirmary, a general hospital containing more than 550 beds, and there are facilities for the study of the various special subjects.

Practical midwifery can be studied at the Princess Mary Maternity Hospital, which contains 90 beds, with an annual indoor and outdoor attendance on 3000 cases.

The bacteriological laboratory is adjacent to Armstrong College.

A *Students' Union* has been erected and furnished at a cost of over £54,000, and is now in daily use. Special accommodation has been provided for women students.

NEWCASTLE-UPON-TYNE ROYAL VICTORIA INFIRMARY.—The Infirmary has 572 beds. Clinical Lectures are delivered by the Physicians and Surgeons weekly and ward demonstrations are given daily. Tutorial classes are held by specially appointed Medical Tutors, Assistant Surgeons and Senior Assistant in the Gynæcological Department, and demonstrations are given in the several out-patient departments daily. Pathological demonstrations are given by the Pathologist daily or as opportunity occurs, and in the new buildings nothing has been spared in perfecting scientific equipment. In addition to medical and surgical in-patient and out-patient departments the following special departments are fully equipped for teaching students: Ophthalmic, Throat, Nose, and Ear, Skin, Gynæcological, and Electrical. The hospital building contains the following laboratories: 1. Special Pathological Laboratory, attached to the post-mortem rooms. 2. Bacteriological Laboratory in which all clinical bacteriological investigations are carried out with a view to treatment by vaccines and serums. 3. There is in addition a Clinical Laboratory attached to each ward and to the out-patient department. There are five operating theatres in use in the hospital. The winter session of 1928 opens on Oct. 2nd and the summer session of 1929 on April 11th.

Applications for detailed information should be made to the Sub-Dean, Dr. Horsley Drummond, at the hospital.

Practical Midwifery is studied at the Princess Mary Maternity Hospital, a new building, excellently equipped, with 90 beds. Instruction is given in Psychological Medicine at the City of Newcastle Mental Hospital. A special course of instruction is given in the City Hospital for Infectious Diseases by the City Officer of Health. Ophthalmology is taught at the Northumberland, Durham, and Newcastle Infirmary for Diseases of the Eye.

Post-graduate Instruction.—1. General courses in Clinical Medicine, Surgery, and Pathology at the Royal Victoria Infirmary, meeting once weekly for ten weeks. One course will be held from October to December and one from April to June. 2. Special courses of clinical instruction, meeting once weekly for ten weeks, in the following subjects: Gynæcology; Diseases of the Eye; Diseases of the Throat, Nose, and Ear; Diseases of the Skin; Venereal Diseases; Neurology; Diseases of Children: Electrotherapeutics and Radiology; special courses in Midwifery will be held at the Princess Mary Maternity Hospital. 3. An intensive course of 14 days' duration in the early part of the Summer Vacation. 4. In addition to the regular post-graduate courses practitioners may attend the ordinary medical and surgical practice of the Royal Victoria Infirmary, and also at the Princess Mary Maternity Hospital, for specified periods.

UNIVERSITY OF BIRMINGHAM.

The University of Birmingham grants the degrees of M.B., Ch.B., M.D., Ch.M., and Ph.D. (for Research Study), and also a degree and a diploma in Public Health. The course for the Bachelors' degrees extends over five years from the date of commencement of professional study. As a rule the first four of these years must be spent in the University, but the Senate has power of recognising attendance at another University as part of the attendance qualifying for these degrees and of recognising examinations passed at such other Universities as exempting from the examinations in Biology and Organic Chemistry. In the case of such students at least three years must be spent in attendance upon classes at the University. The fifth year may be spent at any other medical school recognised by the University.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—The student must have passed the Matriculation Examination of the Joint Board or an examination accepted in lieu thereof, and a recognised Pre-Medical Examination in Chemistry and Physics. All communications respecting the Matriculation Examination, and examinations accepted in lieu thereof, must be sent to the Secretary, Joint Matriculation Board, 315, Oxford-road, Manchester. First Examination.—Part I., Elementary Biology and Organic Chemistry; Part II., Anatomy and Physiology. Second Examination.—General Pathology and Bacteriology, Materia Medica, and Pharmacy. Third Examinations (at the end of the fourth year).—Forensic Medicine, Toxicology, Public Health, and Therapeutics. Two years' hospital work must have been accomplished. Final Examination.—Medicine, Surgery, Midwifery, Diseases of Women, Mental Diseases, and Ophthalmology. Attendance at a general hospital for a year after the passing of the third examination will be required, also attendance at a fever hospital three months, maternity hospital three months, and mental hospital three months.

ROYAL FREE HOSPITAL, LONDON: SCHOOL OF MEDICINE FOR WOMEN.—The Royal Free Hospital contains 268 beds. The Hospital also has large Casualty and Out-patient Departments, and Departments for Special Diseases. A new and specially equipped block contains the Obstetrical and Gynæcological Unit, which controls 68 beds. A Children's Department, including 18 cots, an Orthopædic Department, and a Light Department have recently been added to the Hospital. Maternity Districts are attached to the Unit operating in the Gray's Inn-road and Essex-road areas. Students also attend the in-patient and out-patient practice of the Elizabeth Garrett Anderson Hospital, Cancer Hospital, Hospital for Sick Children, Great Ormond-street, National Hospital for Paralysed and Epileptic, South London Hospital, and Royal London Ophthalmic Hospital.

A Clinical Unit in Obstetrics has been established. Courses are arranged for the Primary Fellowship Examination of the College of Surgeons; also for dental students in conjunction with the Royal London Dental Hospital, Leicester-square.

The School buildings have been entirely rebuilt in recent years, and there are spacious, well-equipped laboratories, which afford every facility for efficiency of teaching and practical work in all departments.

There are residential chambers at 8, Hunter-street, 25, Gordon-square, 9 and 16, Brunswick-square, 5, Mecklenburgh-square, and 36, Tavistock-square, and the Warden can be consulted on the subject of other residences for students.

Students after qualification can hold the posts of house physicians, house surgeons, obstetric assistants. clinical assistants, assistant anæsthetist, medical, gynæcological, and surgical registrars, and assistant pathologist; and at the Medical School the posts of demonstrators in the departments of Anatomy, Physiology, Pharmacology, Biology, Chemistry, and Physics. Many other resident posts in London and elsewhere are also open to them.

Scholarships and Prizes.—(*a*) Isabel Thorne Scholarship, £30. (*b*) St. Dunstan's Medical Exhibition, £60 a year, tenable for three or five years. (*c*) Mrs. George M. Smith Scholarship, £50 a year, tenable for three or five years. (*d*) Bostock Scholarship, tenable for two or four years, £90 (*e*) Mabel Sharman-Crawford Scholarship, tenable for four years, £20 a year. (*f*) Sir Owen Roberts Scholarship, £75 a year for four years. (*g*) Mabel Webb Research Scholarship, tenable for one year and renewable, £30, Physiology, Chemistry, or Pathology. (*h*) Fanny Butler Scholarship, tenable for four years; next award in July, 1931, £16. (*i*) John Byron Bursary, tenable for two years, for students already in the School requiring assistance for the prosecution of their medical studies; application to the Secretary by March 31st next, £20. (*k*) Helen Prideaux Prize and Julia Ann H. Cock Prize, awarded alternately every year to a student who has become qualified during the two years immediately preceding the award, and to be spent in assisting the holder to further study, £60 each. (*l*) Dr. Edith Pechey Phipson Post-graduate Scholarship of the value of £100, awarded annually in June. It is open to all medical women, preferably coming from India, or going to work in India, for assistance in Post-graduate study. (*m*) Sarah Holborn Scholarship, value £20 a year for three or five years, awarded every alternate year; next award in 1929. (*n*) Dr. Margaret Todd Scholarship, tenable for four years, £37 10s. a year, awarded in alternate years; next award in July, 1929. (*o*) Lieutenant Edmund Lewis and Lieutenant Alan Lewis Memorial Scholarship, tenable for four years, awarded every four years; next award in July, 1928. (*p*) Alfred Langton Scholarships, tenable two years, one awarded annually, £50 a year. (*q*) School Jubilee Bursary, tenable for three years, £50 a year. (*r*) Flora Murray Bursary, awarded every year to a fifth-year student, £50. The Dorothy Chick Gift, £20, is awarded annually for efficiency in Practical Midwifery. Two Richardson-Kuhlmann Prizes are given each year, value £12, for proficiency in Clinical Obstetrics, value £8, for proficiency in senior subjects respectively. Two Evans Prizes of £2 2s. and £1 1s. are given each year on the results of the class examination in Midwifery. The Evans Prize for Operative Midwifery, value £5 5*s.*; the Dr. Helen Webb Prize for Children's Diseases, £5 5*s.*; the Mary Swann Prize in Gynæcology, £5 5*s.*; *the* Edward Hanson Prize in Physiology, £2 10*s.*; *and the* Edith Pechey Phipson Prize in Pharmacology, value £3 3*s.*, are awarded annually.

The Students' Union *arranges the* social, athletic, and other clubs and societies. The School sports ground, consisting of 7½ *acres of* freehold land, is situated at Sudbury (easily reached from Euston Station).

Inquiries may be addressed to the Warden and Secretary of the Medical School, 8, Hunter-street, London, W.C.

UNIVERSITY OF DURHAM.

The University of Durham grants degrees of Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, Master of Surgery, Doctor of Surgery, Bachelor of Hygiene, Doctor of Hygiene, Bachelor of Dental Surgery and Master of Dental Surgery, the Diploma in Public Health, Diploma in Psychiatry, and a Licence in Dental Surgery.

For the degrees of *Bachelor of Medicine* and *Bachelor of Surgery* there are four professional examinations. The subjects of the First Examination are—Elementary Biology and Organic Chemistry. The subjects of the Second Examination are—Anatomy and Physiology. The subjects of the Third Examination are—Materia Medica, Pharmacology, general principles of Therapeutics and Pharmacy, Medical Jurisprudence, Public Health, and Pathology and Bacteriology. The subjects of the Fourth Examination are—Medicine, Clinical Medicine, Surgery, Clinical Surgery, Operative Surgery, Midwifery and Gynæcology, Psychological Medicine, Diseases of the Skin, of the Throat, Nose, and Ear, and of Children, and Ophthalmology. It is required that at least one of the five years of professional education shall be spent at the University of Durham College of Medicine, Newcastle-upon-Tyne.

For the degrees of *Doctor of Medicine* and *Master of Surgery* a candidate must not be less than 24 years of age. He must also have obtained the degrees of Bachelor of Medicine and Surgery of the University of Durham, and must have been engaged for at least two years subsequently to the date of admission to these degrees in research work, or in attendance on the practice of a recognised hospital, or in the naval or military services, or in medical or surgical practice. The candidate for the M.D. degree may present an essay or undergo a special examination in the subjects of Medical Anatomy, Medical Pathology, and the Principles and Practice of Medicine. The subjects of examination for the M.S. are:—Principles and Practice of Surgery, Surgical Pathology, Surgical Anatomy, Surgical Operations, Clinical Surgery.

Doctor of Medicine (without residence).—The University of Durham has instituted a special examination whereby the degree of Doctor of Medicine may be obtained without residence. Candidates must not be under 40 years of age and must have been in active practice for 15 years as registered medical practitioners. They must also produce certificates of moral character from three registered members of the medical profession. The fee is 50 guineas (including the degree fee), of which 20 guineas is retained if the candidate fails to satisfy the examiners.

Doctor of Surgery.—The University of Durham grants the Degree of Doctor of Surgery. Candidates for this degree must be registered medical practitioners, and not less than 24 years of age. They must devote three years, subsequently to obtaining a registrable qualification, to the study of Surgery and ancillary subjects. One at least of the three years must be spent in the University. The candi-

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for the degrees of Bachelor of Medicine and of Surgery must have attained the age of 22 years on the day of graduation. At least two of the five years of medical study must have been passed in the University, and one year at least must have been passed in the University subsequently to the date of passing the First Examination. The other three years may be passed at any college or medical school recognised for this purpose by the University. Candidates must pass three examinations entitled respectively: the First Examination, the Second Examination, and the Final Examination. The subjects of the First Examination are: (1) Chemistry; (2) Physics; (3) Biology (Zoology and Botany). The subjects of the Second Examination are (*a*) (1) Anatomy; (2) Physiology (including Physiological Chemistry and Histology); and (*b*) (3) Elementary Bacteriology, (4) Clinical Chemistry, (5) General Pathology. Candidates may present themselves in (*a*) or (*b*) separately. The subjects for the Final Examination are: (*a*) (1) Special Pathology and Morbid Anatomy; (2) Forensic Medicine and Toxicology; (3) Public Health; (4) Pharmacology and General Therapeutics; (*b*) (5) Obstetrics and Diseases of Women; (6) Surgery, Systematic, Clinical, Operative and Practical, including Ophthalmology; (7) Medicine, Systematic and Clinical, including Therapeutics, Mental Diseases, and Diseases of Children. Candidates may present themselves in Parts (*a*) and (*b*) separately, but candidates must have completed the fifth year of medical study before taking Part (*b*).

Degrees of Doctor of Medicine and Master of Surgery. No candidate will be admitted to the degree of Doctor of Medicine or Master of Surgery unless he has previously received the Degrees of Bachelor of Medicine and Bachelor of Surgery, and at least two years have elapsed since he passed the examinations for those degrees. Candidates for the degree of Doctor of Medicine are required to present a thesis together with, if desired, published original work relative to medical science. and unless the thesis is of special merit to submit to an examination in medicine, or to a special written or oral examination on subjects connected with the thesis.

The University also awards a *Diploma in Medical Radiology and Electrology*—Part I., Physics: Part II., Radiology and Electrology. The parts may be taken at one examination or separately.

Scholarships, Fellowships, and Prizes.—The following are awarded: (*a*) Robert Gee Entrance Scholarship (Men), annually, of £42 10*s*.. tenable for four years; (*b*) Lyon Jones Scholarship, No. 1, of £21 per annum, tenable for two years, Competitive Examination among Junior Students in First M.B. Subjects; (*c*) Lyon Jones Scholarship, No. 2, of £21, Competitive Examination on results of Professional Examination in Anatomy, Physiology, Elementary Bacteriology, Clinical Chemistry, and General Pathology; (*d*) Derby Exhibition of £15, Competitive Examination among Fourth- or Fifth-year Students in Clinical Subjects, and (*e*) Clinical School Exhibition of £15 annually for Fourth- or Fifth-year students; (*f*) University Scholarship of £50 for one year, awarded on results of the Final (Part A) Examination for the degrees; (*g*) Holt Fellowships, Physiology and Pathology, of £150 each, for one year; (*h*) Gee Fellowship, Anatomy, of £100, for one year; (*i*) John Rankin Fellowships in Anatomy, two, each of the value of £120, tenable for two years; (*j*) Johnston Colonial Fellowship, Biochemistry, of £100, for one year; (*k*) John W. Garrett International Fellowship, Bacteriology, of £100, for one year; (*l*) Thelwall Thomas Fellowship, Surgical Pathology, of £150, for one year; (*m*) Ethel Boyce Fellowship in Gynæcological Pathology, of £100 for one year; (*n*) Mary Birrell Davies Memorial Fund Scholarship, of the value of £80, tenable for four years, offered for competition in alternate years; open only to women students who will have attained the age of 19 on the first day of October next following the award; (*o*) Rankin Exhibition in Practical Anatomy, of £25, for one year; (*p*) Lady Jones Research Fellowship in Orthopædic Surgery, £200; (*q*) Samuels Memorial Scholarships, three at £20; numerous prizes and medals.

The Medical School.—All the laboratories and classrooms are situated close together, communicating with one another, and are made up of four large blocks of buildings which form one side of the College quadrangle. There are the Johnston Laboratories for Experimental Medicine and Biochemistry; the Medical School for Anatomy, Surgery, Toxicology, and Ophthalmology; and the Thompson-Yates Laboratories for Physiology and Pathology. There is also a separate building for Tropical Medicine. Medical research has also been endowed with several new laboratories in which students can pursue research work after graduation.

Clinical Studies.—The Clinical School of the University consists of four general hospitals—the ROYAL INFIRMARY, the DAVID LEWIS NORTHERN HOSPITAL, the ROYAL SOUTHERN HOSPITAL, and the STANLEY HOSPITAL; and of six special hospitals—the Eye and Ear Infirmary, the Hospital for Women (with the Samaritan Hospital), Liverpool Maternity Hospital, the Royal Liverpool Children's Hospital, St. Paul's Eye Hospital, and St. George's Hospital for Skin Diseases. These hospitals contain in all a total of about 1445 beds. The organisation of these hospitals to form one teaching institution provides the medical student and the medical practitioner with a field for clinical education and study which is unrivalled in extent in the United Kingdom. All the hospitals are within easy access of the University. There are a large number of appointments to house physicianships and surgeonships both at the general and special hospitals which are open to qualified students of the school.

Public Health Department.—This is located in a separate building, in which full courses of instruction are given to students for the Diplomas and Degrees of the University and of other Examining Boards.

Prospectuses and further information may be had on application to the Dean of the Faculty of Medicine, University of Liverpool.

VICTORIA UNIVERSITY OF MANCHESTER.

Four degrees in Medicine and Surgery are conferred by the University—viz., Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). A Diploma in Psychological Medicine, a Diploma in Public Health, and a Diploma in Bacteriology are awarded by examination to registered medical practitioners.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Before admission to the degree of M.B. or Ch.B. candidates are required to present certificates that they will have attained the age of 21 years on the day of graduation, and that they have pursued the courses of study required by the University Regulations during a period of not less than five and a half years subsequently to the date of their registration by the General Medical Council, two of such years having been passed in the University subsequently to the date of passing the first M.B. Examination.

The First Examination: (1) Chemistry and Physics; (2) (*a*) Botany, (*b*) Zoology. Candidates must have attended during at least six months' courses both of lectures and of laboratory work in each of the abovenamed subjects. The Examination is divided into two parts: Part I. Inorganic and Elementary Organic Chemistry and Physics; Part 2. (*a*) Botany, (*b*) Zoology. The candidates sit for these parts separately. The Second Examination: (1) Anatomy and Histology: (2) Physiology, including Physiological Chemistry. The Third Examination: (1) Pharmacology and Materia Medica; (2) Pathology. The Final Examination: (1) Medicine, Systematic and Clinical (including Mental Diseases and Diseases of Children); (2) Surgery, Systematic, Clinical, and Practical; (3) Obstetrics and Gynæcology (including Clinical and Practical); (4) Forensic Medicine (including an Oral Examination); (5) Hygiene and Preventive Medicine. The Final Examination is divided into two parts: Part I., Forensic Medicine, Hygiene and Preventive Medicine; Part II., Medicine, Surgery, Obstetrics and Gynæcology (Systematic, Clinical, and Oral). Candidates for the Second Part must have completed the sixth year of medical study.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine unless they have previously obtained the degrees of Bachelor of Medicine and Bachelor of Surgery and at least one year has elapsed since they passed the examination for those degrees. Candidates may elect either (1) to present an original dissertation; or (2) to undergo an examination. The dissertation must embody the results of personal observation or original research, either in some department of medicine or of some science directly relative to medicine. The examination, which will be written and practical, is in the Principles and Practice of Medicine, in Pathology, and in some other subject to be selected by the candidate.

Degree of Master of Surgery.—Candidates are not eligible for the degree of Master of Surgery unless they have previously obtained the degrees of Bachelor of Medicine and Bachelor of Surgery and at least one year has elapsed since they passed the examination for those degrees. The degree is conferred in the following branches: Surgery (Branch I.), Gynæcology (Branch II.), Ophthalmology (Branch III.), Laryngology, Otology, and Rhinology (Branch IV.).

Degrees of B.Sc. and M.Sc.—The ordinary degree of B.Sc. in the Schools of Anatomy and Physiology may be obtained by students in Medicine who in their third year of study for the degree of M.B., Ch.B. complete the additional courses in these subjects prescribed for this degree. Candidates for the Honours degree of B.Sc. in Anatomy or Physiology, who are students in Medicine, are required to attend courses in advanced Anatomy and Physiology for four terms after passing the Second Examination for the degrees of M.B., Ch.B. Graduates in science may proceed to the degree of M.Sc. by presentation of an approved thesis.

Scholarships, Fellowships, and Prizes.—The following are offered in connexion with medical study at the Victoria University:—Scholarships: Dreschfeld Entrance (triennial), £20; John Russell Medical Entrance, £45; Sam Gamble Entrance for Women; Graduate Entrance (fees up to 160 guineas); two Dauntesey Medical Junior, £50 each; Dauntesey Medical Senior, £50; Professor Tom Jones Exhibition in Anatomy, £25; Dickenson Trust Scholarships in Anatomy and Pathology; Platt Physiological, £90; Graduate Research Scholarship, £70; Dickenson Trust Travelling Scholarships in Medicine and Surgery; Ashby Memorial in Diseases of Children (triennial), £100; John Henry Agnew in Diseases of Children, £120. Fellowships: Leech Research, £70; Professor Tom Jones, Surgical, £105; Morrison Watson in Anatomy, £150; Delépine in Preventive Medicine (biennial), £300; Honorary Research Fellowships. Prizes: Sidney Renshaw in Physiology, £15; Turner Medical, £20; Dumville Surgical, £15; Knight Prize in Psychological Medicine, £50; Graduate Prizes, £5 each. There are many general entrance scholarships, in addition to those already mentioned, open for competition, the examinations for which are held in the month of May. Full particulars can be obtained from the Registrar.

The Medical School.—This school, largely extended in 1920, is provided with dissecting-rooms, X ray rooms, physiological laboratories, private laboratories, and work-rooms, besides lecture-rooms, museums, and general and departmental libraries. A special laboratory is equipped for experimental work on the central nervous system. In the pathological laboratories ample provision is made for the teaching of pathology and bacteriology and for the prosecution of original research. The Helen Swindells Laboratory is specially equipped for cancer research and investigation in general pathology. Ample facilities for investigation are provided in Anatomy, Physiology, and Materia Medica. In the public health department, which is lodged in a separate institute in York Place, near the Royal Infirmary, suitable laboratory accommodation is provided for the study of sanitary chemistry, physics, and practical bacteriology in the departments of chemistry and physics and in that of pathology.

Clinical Studies.—The clinical and practical departments of medical study are taught partly in the Medical School and partly in the Royal Infirmary and St. Mary's Hospitals for Women and Children, a fever hospital, mental hospitals, a convalescent home, and other special hospitals. Medical and Surgical Clinical Classes are conducted in the Infirmary, and separate instruction is afforded in the elements of Medical and Surgical Physical Diagnosis, in Obstetric Medicine, Ophthalmic Surgery, and Pathological Anatomy by the different members of the staff of the Medical School and Infirmary.

Post-graduate Studies.—Post-graduate Courses in Medicine and Surgery have been arranged for during 1928–29 as follows, in addition to those usually held at the various hospitals: 1. Whole-time intensive courses in (*a*) Medicine and Surgery, and (*b*) Obstetrics and Gynæcology. 2. Part-time courses in (*a*) Diseases of the Eye, (*b*) Application of Radiology to Medicine in Diagnosis and Treatment, (*c*) Diseases of the Skin, (*d*) Clinical Pathology. 3. Clinical Assistantships. Syllabuses and other information may be had on application to the Dean of the Medical School, Manchester University.

MANCHESTER ROYAL INFIRMARY.—The Manchester Royal Infirmary is built on the pavilion system, near the University, and has accommodation for 668 patients (including 54 beds at the Central Branch). The medical side consists of four units, each unit having a testing-room for the scientific investigation of morbid products and a class-room. The surgical beds are also arranged in five units, each unit having its own operation theatre, with anæsthetising, recovery, sterilising, testing and apparatus rooms, and its own class-room attached. All of these units are occupied. In the educational block is a large lecture theatre and a museum. In the same building is housed the X ray department, which has nine separate X ray outfits for different purposes, and in which one large room is put aside specially for X ray demonstrations and teaching purposes. A large massage school is also connected with this department.

Associated with the Infirmary are: (1) the Convalescent Hospital at Cheadle, containing 132 beds; (2) the Royal Lunatic Hospital at Cheadle, accommodating with its branches 430 patients; and (3) the Central Branch in the City, which has now accommodation for 54 patients. The Associated Hospitals thus contain 1230 beds and are under the same management. Women students are admitted on the same terms as men.

Two Entrance Scholarships in Medicine of the value of £160 each are offered annually by the Council of the Manchester University and the Medical Board of the Manchester Royal Infirmary for proficiency in Arts and Science subjects respectively. Other scholarships and prizes are mentioned in the College syllabus. Numerous annual appointments and junior appointments may be held by those who have attended the practice of the Infirmary.

ROYAL MANCHESTER CHILDREN'S HOSPITAL, Pendlebury, Gartside-street, Manchester, and Lytham St. Anne's.—The hospital contains 190 beds and 30 in the Convalescent Home, Lytham St. Anne's. The medical staff visit the hospital daily at 10 A.M. Clinical instruction is given by the medical staff at the Hospital and Dispensary. There is a new Massage and Electrotherapeutic Department, also an Artificial Sunlight Department. Four Clinical Assistants are appointed for periods of six months. In throwing open these appointments to qualified medical men and women, the Board is actuated by the desire to aid those qualified medical men and women who wish to have opportunities for the further study of disease in children, or who wish to fit themselves for posts as Medical Officers to Children's Hospitals, to Child Welfare Centres, or for School Medical Officer appointments. There is an Orthopædic Department. Out-patients' day is on Tuesday at Gartside-street, and a ward at Pendlebury is devoted to cases needing operative treatment. Out-patients are seen daily at 9 A.M. at the Out-patient Department, Gartside-street, Manchester. Secretary: Mr. W. M. Humphry.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Park-place, Cheetham Hill-road, Manchester.—The hospital contains 73 beds. Out-patients are seen daily from 8.30 to 12 noon.

UNIVERSITY OF LEEDS.

Four degrees in Medicine and Surgery are conferred—viz.: Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), also Degrees and Diplomas in Dental Surgery and Diplomas in Public Health and in Psychological Medicine. The courses and Degrees in the Faculty are open to men and women alike.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for these degrees are required to present certificates showing that they will have attained the age of 21 years on the day of graduation, and have attended courses approved by the University extending over not less than five years, two of such years at least having been passed in the University, one of which must be subsequent to the date of passing the First Examination. Candidates must also satisfy the examiners in the several subjects of the following examinations, entitled respectively: the Matriculation Examination, or such other examination as may have been recognised by the Joint Matriculation Board in its stead; the First Examination; the Second Examination; and the Final Examination. The First Examination consists of: Part I., Physics and Inorganic Chemistry; Part II., Zoology and Botany. Candidates will be allowed to pass the two parts separately. The Second Examination consists of: Part I., Organic Chemistry; Part II., Materia Medica and Practical Pharmacy; Part III., Anatomy, Physiology; Part IV., Pharmacology. Candidates will be allowed to pass any parts separately, but Part I. must be passed before Parts II., III., or IV. The Final Examination consists of: Part I., Pathology and Bacteriology; Part II., Medicine, Surgery, Obstetrics, Gynæcology, and Clinical Pathology; Part III., Forensic Medicine, Public Health, and Therapeutics. Part I. may be taken at the end of the second clinical year, and Parts II. and III. may be taken at the end of the third clinical year, but not before the completion of the fifth year of medical study. If taken separately Part II. may be passed before Part III.

Degree of Doctor of Medicine and Master of Surgery.—Candidates are not eligible for the degree of Doctor of Medicine or Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery of the University (or of Victoria prior to December, 1904) and at least two years' Hospital Practice or four years' other professional practice for the former, and one year has elapsed for the latter since they passed the examination for those degrees. Candidates for the degree of Doctor of Medicine may present a dissertation and, if the dissertation is considered to be of exceptional merit, will not be required to pass an examination. The first term commences on Oct. 1st. Prospectus can be obtained from the Academic Sub-Dean.

Post-graduate work.—Practitioners wishing to attend Infirmary practice during short periods, or post-graduate classes held by members of the clinical staff, may do so on application to the Clinical Sub-Dean, from whom particulars may be obtained.

Clinical Studies.—The clinical studies are pursued mainly at the Leeds General Infirmary, which has accommodation for 630 in-patients, including 88 beds at branch hospitals in the country. Clinical teaching takes place daily in the wards, and Clinical lectures are given in Medicine and Surgery by the Physicians and Surgeons. There are Medical, Surgical, Ophthalmic, Aural, Electrotherapeutic, and Radiographic Departments, in each of which special instruction is imparted to students. Gynæcological and Children's Departments, together with Laryngeal, Venereal, and Skin Clinics, are in operation, and there is a special ward for cases of nutritional disorders of children. Several valuable prizes are given at the end of each session. Numerous appointments at the Infirmary are annually open to students after qualification. Further particulars concerning these, and the scholarships and prizes open to competition, may be obtained from the Dean of the Faculty of Medicine.

In addition to work in the General Infirmary, clinical instruction in obstetrics is given in the Leeds Maternity Hospital and in mental and infectious diseases in the Wakefield (W.R.) Mental Hospital and Leeds City Fever Hospital respectively.

UNIVERSITY OF SHEFFIELD.

The Degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There is also a Diploma of Licentiate in Dental Surgery. The courses and degrees in the Faculty of Medicine are open to men and women alike. Candidates must matriculate in the University or pass such other examination as may be recognised for this purpose by the University and sanctioned by the Joint Matriculation Board, and must pass also the further examination in Chemistry and Physics.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A candidate must have attained the age of 22 years on the day of graduation and have pursued the courses of study required by the University regulations during a period of not less than five years subsequently to the date of his matriculation and the passing of the further examination in Chemistry and Physics, three of such years at least having been passed in the University, one at least being subsequent to the passing of the First Examination. The subjects of the First Examination are Chemistry, Physics, and Biology. The Intermediate B.Sc. Examination in these subjects will, on payment of the required additional fee, be accepted instead of this examination. Candidates must, after matriculation and the passing of the further examination in Physics and Chemistry, and registration as medical students, have attended courses of instruction (lectures and laboratory work) in chemistry, physics, and biology for one year each. The Second Examination: The subjects are Anatomy and Physiology. Candidates must have completed the second year of professional study. The Third Examination: The subjects are Pathology, Pharmacology, Anatomy, and Physiology. Candidates must have completed the Lent Term of the fourth year of professional study. The Final Examination: The subjects of the examination are: Part I., Forensic Medicine and Public Health; Part II., Medicine (including Mental Diseases and Diseases of Children), Surgery, Obstetrics (including Gynæcology). Candidates for Part I. must have completed the Michaelmas Term of the fifth year of professional study; candidates for Part II. must have completed the fifth year of professional study.

Degree of Doctor of Medicine.—Candidates for the degree of Doctor of Medicine must have passed the examination for the degrees of M.B., Ch.B. at least one year previously, must present a thesis embodying observations in some subject approved by the professor of medicine, and must pass an examination in the Principles and Practice of Medicine.

Degree of Master of Surgery.—Candidates must have taken the M.B., Ch.B. at least one year previously, and must since have held for not less than six months a surgical appointment in a public hospital.

The subjects of examination are Systematic, Clinical, and Operative Surgery, Surgical Anatomy, Surgical Pathology and Bacteriology.

Scholarships and Prizes.—The following are awarded: Four Town Trustees scholarships, offered annually, each of the value of £50 per annum for three years. Medical: offered annually, covers cost of medical curriculum. Six Edgar Allen, offered annually, each of the value of £125 per annum for three years. Post-graduate: Frederick Clifford scholarship, value £50 per annum, tenable for two years. Mechanics' Institute scholarship, value £50 for one year, renewable for a second year. Town Trustees fellowship, value £75 for one year. Medals and Prizes: Kaye scholarship; Gold Medal in Clinical Medicine and Surgery; John Hall Gold Medal in Pathology; Holroyd Gold Medal in Anæsthetics; bronze medals. Particulars of all the above may be obtained from the Registrar.

The Medical School.—The Medical Department occupies the entire north wing of the University quadrangle. The various athletic and other students' societies are under the management of the Union Representative Council, elected annually. There are large and comfortable common rooms both for men and women students, and two Students' Unions, one for men and one for women. A refectory is open daily at the University where students may obtain meals and refreshments at moderate prices. The University journal, *Floreamus*, edited by a committee of staff and students, is published each term. The University Halls, "Oakholme," Clarkehouse-road; "Tapton Cliffe," Fulwood-road, and "Endcliffe University Hall," Endcliffe Vale-road, are recognised by the Senate as halls of residence for women students; full particulars may be obtained from the tutor for women students. Stephenson Hall is a hall of residence for men students; particulars may be obtained from the Warden.

Clinical Studies.—The University is within easy reach of the various hospitals with which it is connected for clinical purposes.

The SHEFFIELD ROYAL INFIRMARY (500 beds) provides all the opportunities of a large general hospital with special departments for Skin and Ear. The Sheffield Royal Hospital, 320 beds, has special out-patient departments for Diseases of the Throat, Ear, Skin, Orthopædics, and Mental Diseases. The two institutions are amalgamated for the purposes of clinical practice, medical, surgical, and special. There are special departments for the treatment of Diseases of the Eye, with wards assigned to them, at both hospitals, and excellent junior appointments. The Jessop Hospital for Diseases of Women, with 142 beds, has also a Maternity department, with about 900 in-patients per annum and about 250 out-patient cases attended. The Children's Hospital has 85 beds. Special courses on Fevers are held at the City Fever Hospitals (690 beds) and on Mental Diseases at the South Yorkshire Mental Hospital (1860 beds). Every facility is afforded in the various laboratories for the prosecution of advanced studies and research.

Post-graduate Courses.—Post-graduate courses of clinical instruction are held annually in the various hospitals connected with the School.

UNIVERSITY OF BRISTOL.

In the Faculty of Medicine there are the following degrees:—Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S). There are also the following diplomas: Diploma in Public Health (D.P.H.), Diploma in Dental Surgery (L.D.S.), and Diploma in Veterinary State Medicine.

All candidates for degrees in Medicine, Surgery, and Dentistry are required to pass, at Matriculation standard, an examination called the School Certificate Examination, or to pass such examination as may be regarded as equivalent by the Senate. All courses, degrees, and diplomas are open to men and women alike.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates shall be not less than 21 years of age and shall have pursued the courses prescribed by University Regulations during not less than five years after passing the first examination in Chemistry and Physics, of which three shall have been passed in the University, and two of these three subsequent to passing the second examination. All candidates for the degrees of M.B., Ch.B., are required to satisfy the examiners in the several subjects of three examinations. The First Examination: The subjects of examination are: Chemistry (Inorganic), Physics, and Biology, the courses pursued being those for the time being approved for the intermediate part of the B.Sc. curriculum. This part of the curriculum shall extend over one year. (Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination and will be regarded as having completed one year of study.) The Second Examination: The subjects of examination are: Organic Chemistry and Elementary Anatomy (Part I.) and Advanced Anatomy and Physiology (Part II.). The Final Examination: The subjects of examination are: Materia Medica and Pharmacy, Pharmacology and Therapeutics, General Pathology, Morbid Anatomy, and Bacteriology (Part I.); Special Pathology, Forensic Medicine, Toxicology, and Public Health, Obstetrics (including Diseases of Women), Surgery (Systematic, Clinical, Practical, and Operative), Medicine (Systematic, Clinical, and Practical, including Mental Diseases) (Part II.). The subjects included in Part II. may be taken in two groups—viz., Group I., Surgery and Obstetrics; Group II., Medicine, Public Health, Special Pathology, Forensic Medicine, and Toxicology. Candidates may pass Parts I. and II. together, or separately, and the two groups of Part II. may be taken together or separately. Forensic Medicine and Toxicology may be taken with Part I., or with Group II. of Part II.

Degree of Doctor of Medicine.—Candidates shall be Bachelors of the University of not less than two years' standing as such and may elect either (1) to pass an examination in General Medicine, or (2) to pass an examination in State Medicine, or (3) to present a Dissertation. The candidate who elects to pass the examination in State Medicine must hold a diploma in Public Health of some University or College, and the candidate who elects to present a Dissertation may be examined in the subject thereof.

Degree of Master of Surgery.—Candidates shall be Bachelors of not less than two years as such, during which period they shall have attended the Surgical Practice of an institution approved for the purpose. They shall pass an examination in Surgical Anatomy, Pathology, and Bacteriology, and Operative, Clinical, and General Surgery, and present to the University a Dissertation on some subject of Surgery. The degree may be taken also in General Surgery, and a Special Subject—e.g., Oto-Rhino-Laryngology, Ophthalmology, and Gynæcology.

Clinical Studies.—The allied hospitals (BRISTOL ROYAL INFIRMARY and BRISTOL GENERAL HOSPITAL) have between them about 600 beds and extensive out-patient departments, special clinics for Diseases of Women and Children and those of the Eye, Throat and Ear, in addition to large and well-equipped departments for Dental work and large outdoor Maternity Departments.

At each of these institutions there are well-arranged pathological museums, post-mortem rooms, and laboratories for Morbid Anatomy. There are also laboratories for work in Clinical Pathology, Bacteriology, and Cytology, in which special instruction is given in these subjects. Departments are provided and well equipped for X ray work, both for diagnosis and treatment, the various forms of Electrical treatment, including High-frequency Currents, Electric Baths, Finsen Light treatment, and Massage.

The students of the school also attend the practice of the Royal Hospital for Sick Children and Women, containing 140 beds, and that of the Bristol Eye Hospital, with 40 beds. The total number of beds available for clinical instruction is therefore about 750.

There are numerous salaried junior appointments for residents who are graduates.

Scholarships and Prizes.—The following are awarded: The Ashworth Hallett Scholarship, value £45, open to women only; two Martin Memorial Pathological Scholarships of £10 each; the Tibbits Memorial Prize, value 9 guineas, for proficiency in practical surgery; the Committee's Gold and Silver Medals for fifth-year students for general proficiency; the Augustin Prichard Prize, value about 6 guineas, for proficiency in anatomy; the Henry Clark Prize, value 11 guineas, for proficiency in gynæcology; the Crosby Leonard Prize, value 7 guineas, for proficiency in surgery; the Suple Surgical Prize, a gold medal and 7 guineas; the Suple Medical Prize, a gold medal and 7 guineas; the Henry Marshall Prize, value £12, for dressers; the H. M. Clarke Scholarship, value £15, for proficiency in surgery; the Sanders Scholarship, value £22 10*s.*, for general proficiency; the Barrett-Roué Scholarship for proficiency in diseases of the eye, ear, nose, and throat, value £14; Lady Haberfield Scholarship, value about 25 guineas; Phyllis Siepman Prize, for proficiency in Diseases of Children, value £25.

Bristol City Senior Scholarships and those offered by the counties of Gloucestershire, Somerset, Wilts, and Devon, are tenable in the University. Some of the Fellowships awarded by the Colston Research Society for research in the University are allotted to the Faculty of Medicine.

Post-graduate Study.—Qualified medical practitioners may be appointed as clinical assistants for a period of one or more months. They may act as assistants, if times permit, in more than one department and in any of the hospitals during their period of study. They will be entitled to the use of the clinical laboratories and medical library, and have the right to attend in all departments, including operations, post-graduate and ordinary clinical demonstrations, and post-mortem examinations. Demonstration courses with weekly lectures are held during May, June, and July.

All inquiries and applications for admission should be addressed to the Director of Post-graduate Studies (Clinical Section), Pathological Department, University of Bristol, who can be seen on any day by appointment.

Further information as to scholarships, curricula, and fees can be obtained from the Dean of the Faculty of Medicine or the Registrar of the University.

UNIVERSITY OF WALES.

This University has, inter alia, the privilege of granting Degrees in Medicine, and Diplomas in Public Health and Tuberculous Diseases. Preliminary courses of study for the Degrees in Medicine may be pursued at any of the constituent Colleges of the University—viz., at Aberystwyth, Bangor, Cardiff, or Swansea. The Welsh National School of Medicine is situated in Cardiff and is an integral part of the University College of South Wales and Monmouthshire there.

Particulars can be obtained on application to the Dean of the Faculty of Medicine, or to the Secretary, Welsh National School of Medicine, Newport-road, Cardiff. All classes are open to both men and women students.

ENGLISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGE OF PHYSICIANS OF LONDON AND THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Under this heading we give the regulations for the examinations enjoined by the Conjoint Examining Board of the Royal Colleges of Physicians of London and Surgeons of England, and of the Society of Apothecaries upon students desiring their respective diplomas of qualification. We do not give any list of schools recognised by these bodies as eligible to prepare students for their examinations beyond mentioning that all the schools which we have already described (under the heading of the Universities to which they are attached) are recognised as suitable places of instruction by the corporations granting medical diplomas. The courses of study at the principal colonial medical schools are also recognised as qualifying for the examinations of these corporations.

Students are required to pass a Preliminary Examination in General Education recognised by the Board, and a *Pre-Medical Examination* in Chemistry and Physics conducted by the Conjoint Examining Board before commencing the five years curriculum of professional study or some other examination recognised by the Board—namely, the examination in Chemistry and Physics for the degree in Medicine of any University recognised by the Board; a Pre-Medical Examination conducted by any of the Qualifying Bodies whose Degrees or Diplomas are registrable on the Medical Register; the Higher School Certificates of Oxford and Cambridge Universities, and the Oxford and Cambridge Schools Examination Board; the Higher Certificates of London, Bristol, Durham Universities, the Joint Matriculation Board of the Northern Universities, and the Central Welsh Board Higher Certificate. A candidate must enter for Chemistry and Physics together, and he will not be allowed to pass in one without obtaining at the same time at least half the number of marks required to pass in the other subject. He will be admitted to the examination on producing evidence of having passed the required Preliminary Examination in General Education. The examination is partly written, partly oral, and partly practical. A candidate rejected in one or both subjects of the examination will not be admitted to re-examination until after the lapse of a period of not less than three months. The fee for the examination is £3 3*s.*, for re-examination in Chemistry £2 2*s.*, and for re-examination in Physics £1 1*s.*

There are two Professional examinations called the *First* and *Final Examinations*. The courses of study for these examinations may be commenced before the Pre-Medical examination in Chemistry and Physics or some equivalent examination has been passed, provided that three terms of study are completed after the examination has been passed.

The subjects of the First Professional Examination are: Section I. (*a*) Anatomy, including Histology and Embryology. (*b*) Physiology, including Biochemistry. Section II. Pharmacology, Practical Pharmacy, and Materia Medica. A candidate *must* have attended at a recognised Medical School courses of instruction in Anatomy, including Embryology, during five terms, during which he must have dissected the whole body, courses of instruction in Physiology, including General Biology, Biochemistry and Biophysics during five terms, courses of instruction in Pharmacology, Practical Pharmacy, and Materia Medica. A candidate may present himself for the two Sections together or separately, but he must take parts (*a*) and (*b*) of Section I. together until he has passed in one or both parts, but a candidate will not be allowed to pass in one part unless he obtains at the same time at least half the number of marks required to pass in the other part.

Section II. of the examination may be passed at any time before the candidate enters for the Final Professional Examination. The fee for the First Professional Examination is £10 10*s*., for re-examination after rejection in Section I. £6 6*s*., for re-examination after rejection in either part of Section I. £3 3*s*., for re-examination after rejection in Section II. £3 3*s*. A candidate who produces satisfactory evidence of having passed an examination in the subjects of Section I. or of either part of Section I. and of Section II. in the examination for the degree in Medicine conducted at a University recognised by the Board will be exempted from further examination in such subjects.

Final Professional Examination.—The subjects of the Final Professional Examination are: Section I. Pathology (including Morbid Anatomy, Morbid Histology, and Clinical Pathology), and Bacteriology. Section II. Part I. Medicine, including Medical Anatomy, Forensic Medicine and Public Health. Part II. Surgery, including Surgical Anatomy and the use of Surgical Appliances. Part III. Midwifery and Gynæcology. The examination is partly written, partly practical, partly clinical, and partly oral. A candidate may take Sections I. and II. and the three parts of Section II. of the Final Examination separately or may take the whole examination together. He will be required to produce the certificates required by the regulations before being admitted to the respective parts of the examination. A candidate who produces evidence of having passed an examination for a degree in medicine in the subjects of Pathology and Bacteriology at a University recognised by the Board is exempted from Section I. The fee for admission to Section I. is £4 4*s*.; for admission to Section II., Part I., £10 10*s*.; Part II., £10 10*s*.; Part III., £6 6*s*.; and the re-examination fees are respectively £3 3*s*., £6 6*s*., £6 6*s*., and £4 4*s*.

Students of recognised universities in England, Scotland, and Ireland, who have passed examinations for a degree in Medicine at their universities in the subjects of the First Examination of the Examining Board, may enter for a part of the Final Examination at the expiration of three years from the date of passing in Anatomy and Physiology on production of the required certificates.

Members of certain recognised Indian, Colonial, and Foreign universities who have passed examinations for the Degree of Doctor or Bachelor of Medicine or Surgery in the subjects of the First Examination may present themselves for the Final Examination under special conditions. The Board also grants Diplomas in Public Health, in Psychological Medicine, in Ophthalmic Medicine and Surgery, in Tropical Medicine and Hygiene, and in Laryngology and Otology. Candidates must hold a Medical qualification registrable in the United Kingdom or be Graduates in Medicine of a recognised Indian, Colonial, or Foreign University. *Particulars* and conditions of admission to all examinations, fees, &c., may be obtained from the Secretary of the Examining Board, Examination Hall, Queen-square, London, W.C. 1.

ROYAL COLLEGE OF PHYSICIANS OF *LONDON*:

THE MEMBERSHIP AND FELLOWSHIP.

The College confers two separate diplomas—the *Fellowship*, a purely honorary distinction, and the *Membership*, obtained by examination.

Membership.—The age for admission to this diploma, it will be noticed, has been changed from 25 to 23 years. The alteration in the by-law of the College is designed to enable men who have just finished house appointments to sit for an examination for which their recent clinical experience has exactly fitted them. The candidate must either have passed the examinations for the licence of the College, or else be a registered medical practitioner who has obtained the degree of Doctor or Bachelor of Medicine at a University recognised by the Censors Board. The examination is directed partly to pathology and partly to the practice of medicine. Credit is also given to candidates who show a knowledge of Latin, Greek, French, or German. Further information may be obtained from the Registrar at the College. The fee for admission as a Member of the College is 40 guineas, except when the candidate for membership is a licentiate of the College, in which case the fee already paid for the licence is deducted from the 40 guineas. The fee for the examination is 8 guineas, which is reckoned as part of the fee for admission in the case of success.

Fellowship.—The *Fellows* are selected annually from the ranks of the *Members* by the Comitia of the College.

ROYAL COLLEGE OF SURGEONS OF ENGLAND:

THE FELLOWSHIP.

The Royal College of Surgeons of England confers its diploma of Fellow upon a few distinguished persons in an honorary capacity. Two *Members of long standing* may also be elected to the Fellowship annually. But the bulk of the Fellows obtain the diploma as the result of examination.

Fellowship.—The examination for the Fellowship is divided into two parts—viz., the First Examination and the Second Examination. The subjects of the First Examination are Anatomy and Physiology, and those of the Second Examination are Surgery, including Surgical Anatomy and Pathology. The examinations are partly written and partly vivâ voce, and include the examination of patients and the performance of operations on the dead body. The First Examination will in future years be held in June and December and the Second Examination in May and November.

The fees for examination are: First Examination, first admission 8 guineas, and for each readmission 5 guineas. Second Examination, each admission 12 guineas. The fee payable on admission to the Fellowship by Members is 10 guineas and by non-Members 30 guineas, in addition to examination fees.

A Member of the College is admissible to the First Examination at any time after receiving his Diploma of Membership. A candidate who is not a Member is admissible after passing the First Professional Examinations of the English Conjoint Board in Anatomy and Physiology, or the equivalent examination in his University, on the production of certificates of attendance upon prescribed courses.

A Member of the College is admissible to the Second Examination at any time after having passed the First Examination, on producing evidence of having been engaged not less than six years in the study (or study and practice) of the profession.

A candidate who is not a Member of the College must possess the registrable surgical and medical degrees of universities recognised by the Council and must have been engaged in the study (or study and practice) of the profession for not less than four years subsequent to the date of obtaining the recognised qualification, one year of which shall have been spent in attendance on the Surgical Practice of a recognised hospital. The diploma of Fellow is not conferred upon successful candidates until they have attained the age of 25 years.

The Regulations may be obtained on application to the Secretary, Examining Board in England, Examination Hall, Queen-square, London, W.C. 1.

SOCIETY OF APOTHECARIES OF LONDON.

The Pre-Medical and Primary examination is held quarterly. Part I. includes Chemistry, Chemical Physics; Practical Chemistry; Materia Medica and Pharmacy. Part II. includes Anatomy, Physiology, and Histology. This examination cannot be passed before the completion of twelve months' Practical Anatomy with Demonstrations, and these subjects cannot be taken separately except in the event of the candidate having previously passed in one.

The Final examination is held monthly except in September. Part I. Clinical Surgery: Principles and Practice of Surgery, Surgical Pathology, and Surgical Anatomy, Operative Manipulation, Instruments, and Appliances. Part II. Clinical Medicine: Medicine, Pharmacology, Pathology, and Morbid Histology; Forensic Medicine, Hygiene, Theory and Practice of Vaccination; and Mental Diseases. *Part III. includes* Midwifery, Gynæcology, and Diseases of New-born Children and the Use of Obstetric Instruments.

The course of study for the *Final examination* includes attendance on the Surgical and Medical Practice, with Post-mortem Examinations, at a hospital connected with a medical school for a period of three winter and three summer sessions, including a course of Practical Midwifery, with attendance on 20 Midwifery cases. The course of medical study must extend over five years, and the office of dresser or clinical clerk must be held at a hospital or other institution recognised by the Society. Three academic years (33 months) must elapse after a candidate has passed the examination in Anatomy and Physiology before he can complete the Final examination.

Evidence shall also be given of practical instruction in Infectious Diseases and in Mental Diseases (at a lunatic asylum or in the wards of an institution containing a special ward set apart for the treatment of mental diseases), and in any two of the following subjects: Ophthalmic Surgery, Laryngology with Rhinology and Otology, Dermatology, and Diseases of Children. Candidates intending to present themselves for examination are required to give 14 days' notice. The fee for the Licence is 20 guineas. Female candidates are admitted to examinations.

Master of Midwifery.—This diploma has now been instituted and the first examinational session will be on Monday, Oct. 15th, 1928. Candidates will be admitted to the examination who have been registered practitioners for at least one year, and who have held a resident appointment in an institution recognised by the Society for six months or more, and who for three months have attended an antenatal clinic and an infant welfare centre, also recognised by the Society. Until 1932 practitioners of ten years' standing may enter for the examination without further formality than the production of satisfactory evidence that they have made a special study of the subjects. The examination will be conducted by written papers and by clinical and oral tests.

The entrance fee for the examination is £5 5*s.* and a further fee, which at present is fixed at £5 5s., will be paid before their admission to the Mastery, by those who have satisfied the examiners. Candidates for the first examination must send in their certificates before Oct. 1st to the Secretary of the Society, Mr. Frank Haydon, who will supply any other information.

The examination offices are open from 10 A.M. to 4 P.M.; on Saturdays from 10 A.M. to 1 P.M. All letters should be addressed to the Secretary, Court of Examiners, Society of Apothecaries of London, Blackfriars, E.C. 4.

PHARMACEUTICAL SOCIETY.

SCHOOL OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN (recognised by the UNIVERSITY OF LONDON).—The Pharmaceutical Society conducts examinations for registration as (*a*) Chemist and Druggist and (*b*) Pharmaceutical Chemist. For registration as Chemist and Druggist the candidate must pass (i) the Preliminary Scientific Examination (subjects Chemistry, Physics, and Botany); and (ii) the Chemist and Druggist Qualifying Examination (subjects Pharmacognosy, Pharmacy, Pharmaceutical Chemistry, and Forensic Pharmacy). Fee for each examination, 6 guineas; for each subsequent examination after failure, 4 and 6 guineas respectively. The Pharmaceutical Chemist Qualifying Examination (for registration as *Pharmaceutical Chemist*) includes Botany, Chemistry, Pharmacognosy, Pharmacy, and Forensic Pharmacy. Candidates must have passed the Preliminary Scientific Examination. Fee, 12 guineas; for each subsequent examination after failure, 6 guineas. Courses of Instruction are given for the Chemist and Druggist Qualifying Examination, and (two years' course) for the Pharmaceutical Chemist Qualifying Examination in conjunction with University College.

An Intercollegiate two years' course for the Final Examination for the degree of B.Pharm. of the University of London is also given in conjunction with University College. Medical students are admitted to the lectures and laboratory work in any or all the courses. Certificates of instruction in the School are received by the Conjoint Board of the Royal Colleges and by the University of London. Graduates in Science may carry out the research work necessary for the thesis for the Ph.D. of the University of London in the Society's Research Laboratories. Application for admission to the school, or for further information, may be made to the Dean, Prof. Greenish, 17, Bloomsbury-square, London, W.C. 1.

The *London College of Pharmacy for Ladies*, 7, Westbourne Park-road, W.2, which is under direct medical supervision, offers a nine months' course of instruction to women in preparation for the Apothecaries' Hall Diploma in dispensing.

METROPOLITAN CENTRES AFFORDING POST-GRADUATE FACILITIES.

Certain organisations and institutions provide for the needs of the medical student in his cirriculum and for the post-graduate student requiring special forms of instruction and opportunities for clinical observation. Many of the institutions are recognised by the English Conjoint Examining Board as a place of study for the fifth year of the curriculum.

Special Diplomas in public health, tropical, psychological, and ophthalmic medicine, medical radiology and electrology, laryngology, otology, and tuberculosis are now granted in proof of intensive work along the different lines indicated. Of these, the Diploma in Public Health, being regulated by the General Medical Council, is registrable. Appointments to and promotion in the various Services are largely dependent on the possession of a particular diploma, and each syllabus of the special courses available at the institutions which follow, either with or without association with the Fellowship of Medicine, is planned to afford the necessary instruction.

The Special Diplomas are dealt with fully on p. 420, where the connexion between the Bethlem Royal Hospital and the Maudsley Hospital and the Diploma in Psychological Medicine is referred to. Similarly the Hospitals of the Metropolitan Asylums Board provide post-graduate as well as under-graduate facilities, while the hospitals of the Seamen's Hospital Society both supply the instruction necessary for the Diploma in Tropical Medicine and Hygiene, and coöperate in the activities of the Fellowship of Medicine and Post-Graduate Medical Association.

HOSPITALS OF THE METROPOLITAN ASYLUMS BOARD. —These hospitals, of which there are 18 in the metropolis and the near vicinity, will shortly come under the administrative powers of the London County Council. The Board hold classes of instruction in fevers at all the infectious hospitals at which ordinary medical students attend, but the only hospital to which a class of instruction for the diploma in public health is attached is the North-Eastern Hospital. This course of lectures and demonstrations (three months) on clinical practice and in hospital administration is given at the North-Eastern Hospital, St. Ann's-road, Tottenham, N. 15, by the medical superintendent, on Mondays and Wednesdays at 4.45 P.M., and alternate Saturdays at 11 A.M., beginning Monday, Oct. 1st, 1928. This course complies with the requirements of the revised D.P.H. regulations of the General Medical Council. Application for further information should be made to the Clerk to the Metropolitan Asylums Board, Victoria Embankment, London, E.C. 4.

SEAMEN'S HOSPITAL SOCIETY.—The Society possesses seven establishments: the Dreadnought Hospital at Greenwich, 250 beds; the Albert Dock Hospital, E. 16, 53 beds; the Hospital for Tropical Diseases, Endsleigh-gardens, W.C. 1, 58 beds; Tilbury Hospital, Tilbury Docks, Essex, 80 beds; Queen Alexandra Memorial Hospital, Marseilles, 60 beds; King George's Sanatorium for Sailors, Bramshott, Hants, 80 beds; and the Angas Home, Cudham, 36 beds. Total, 617 beds. It has also a Dispensary in the East India Dock-road from which patients are transferred to the hospitals. In conjunction with the Fellowship of Medicine arrangements have been made for a course of operative surgery at the Dreadnought Hospital.

The London School of Hygiene and Tropical Medicine is located in the same building as the Society's Hospital for Tropical Diseases at 23, Endsleigh Gardens, Gordon-street, W.C., and the clinical teaching of the School is given in the Hospital (see p. 420).

THE FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.

Certain hospitals or groups of hospitals are working in conjunction with this Association, which has its office in the House of the Royal Society of Medicine, 1, Wimpole-street, W. 1. It provides intensive courses in general and special branches of medicine and surgery, which are arranged at short intervals, and also courses in special subjects the nature of which are indicated by the groups of hospitals coöperating in its teaching work. Demonstrations in clinical medicine, in surgery, and in ophthalmology are arranged also from October to July, and are open to all members of the medical profession without fee. Membership of the Fellowship is open to all qualified medical practitioners, the membership fee being 10*s.* per annum, which includes the subscription to the monthly *Post-Graduate Medical Journal.* Full information regarding the courses of study can be obtained from the Secretary.

GENERAL PRACTICE.

ROYAL NORTHERN GROUP OF HOSPITALS.—The Royal Northern Hospital, Holloway, London, N. 7, is the main institution of the Royal Northern Group of Hospitals, which includes the Royal Chest Hospital, City-road, E.C., Hospital of Recovery, Southgate, and the Reckitt Convalescent Home, Clacton-on-Sea. The total number of beds in the group is 400. Besides the honorary staff there are six anæsthetists, three pathologists, resident medical officer, resident house physician, three resident house surgeons, two resident casualty officers, and one resident obstetric surgeon. The large rectangular and circular wards, each of which contains 25 beds, the children's ward for children under 5 years of age, the observation wards in the new Casualty Department, the two operation theatres, and out-patient department are designed with a view of offering the greatest facilities for clinical work. The Special Departments include the following: Fracture, genito-urinary and neurological, physico-therapeutic, pathological (under a director of clinical pathology), tuberculosis, venereal diseases, and X ray (recently remodelled). Patients are removed to the Hospital of Recovery by ambulance a few days after operation. Demonstrations are given daily in the wards and out-patient departments. Clinical assistants (qualified), clinical clerks, and pathological clerks are appointed in the general and special departments and may receive certificates at the end of their terms of office. A new maternity department has been opened, and the light department has been re-equipped.

Weekly lectures by members of the hon. medical and surgical staff are free to all medical practitioners. Special classes and demonstrations are being arranged for post-graduates. They include instruction in general medicine and surgery, and also lectures and demonstrations in special subjects at the Royal Northern and Royal Chest Hospitals.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N. 15.—This hospital is in the midst of a densely populated neighbourhood and contains medical, surgical, gynæcological, and children's wards, having 200 beds. There are special departments for gynæcological cases, diseases of the eye, ear, throat, and nose, skin diseases, plastic surgery, medical electricity, radiography, and dentistry. Operations are performed every afternoon of the week (except Saturday) at 2.30 P.M. Clinical instruction, ordinarily including laboratory classes, and lectures are given in the wards and out-patient departments, laboratories, and lecture hall in connexion with the North-East London Post-Graduate College attached. There are five resident medical officers, and clinical assistants are appointed under certain conditions. Special intensive post-graduate courses are also held at intervals throughout the year. Further particulars in regard to the hospital may be obtained from Dr. S. C. Shanks, Secretary to the Medical Committee, 87, Harley-street, W. 1; or from Mr. T. H. C. Benians, F.R.C.S., Dean of the College, at the Hospital.

WEST LONDON HOSPITAL, Hammersmith, W.—This hospital has 210 beds. Attached to the hospital is the West London Post-Graduate College. The practice of the hospital is reserved exclusively for qualified men. Instruction is given in the medical and surgical out-patient rooms and demonstrations are given in the wards. Clinical assistantships are obtainable in the various general and special out-patient departments. Special classes are held in Diseases of the Throat and Nose, Skin, and Eye, and in Gynæcology, Medical Electricity, Operative Surgery, Bacteriology, Anæsthetics, Intestinal Surgery, Medical and Surgical Diseases of Children, Blood and Urine, Clinical Microscopy, Cystoscopy, Venereal Diseases, and Operative Ophthalmology, Radiography, X Ray Therapy. The accommodation for post-graduates consists of a lecture room, together with reading, writing, and class rooms. The hospital has a fully equipped pathological laboratory, at which instruction is given in elementary bacteriology. The certificate of the hospital is accepted by the Admiralty, War Office, Colonial Office, and India Office in cases of study leave. Further information can be obtained on application to the Dean, Sir Henry Simson, at the Hospital. Secretary of the Post-Graduate College Mr. C. Cole, and of the Hospital Mr. H. A. Madge.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. (Established 1873; Incorporated 1917.)—The hospital contains 135 beds. The medical and surgical practice of the hospital is open to students and practitioners. Operations: Monday, 1.30 P.M., Tuesday, 2.30 P.M., Wednesday, 9 A.M. and 1 P.M., Thursday, 8 A.M., Friday, 10 A.M. and 3 P.M., and Saturday, 9 A.M. New Out-patient Departments for special diseases have been opened: Neurology, Diseases of the Stomach and Disorders of Digestion, Diseases of Women, Genito-urinary Diseases, Diseases of the Rectum, and Dermatology.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.—In-patient Department: Haverstock Hill, N.W.; Out-patient Department: Bayham-street, Camden Town (130 beds—viz., 102 free, 8 isolation and observation, &c., and 20 paying or contributory). Serves Hampstead and the populous districts of Kentish Town and Camden Town. The out-patients, with the exception of Hampstead casualty and emergency cases, attend exclusively at the Out-patients' Department, Bayham-street, Camden Town. Further particulars from the Secretary at the hospital. Post-graduate work is in connexion with the Fellowship of Medicine.

Queen Mary's Hospital, Stratford.—This hospital has developed from the West Ham and Eastern General Hospital. It has 200 beds and ministers to a very poor public. Founded as a dispensary in 1861, and developing into a hospital in 1890, steady extensions have been made during this century. A Royal Charter was obtained in 1917, and the hospital has become a valuable charity with a full medical staff of physicians and surgeons, and specialists for gynæcology, obstetrics, ophthalmological surgery, radiology, and dental surgery. The Fellowship of Medicine and Post-Graduate Medical Association makes frequent use of the opportunities here offered.

Particulars may be obtained from Major Raphael Jackson, Secretary, Queen Mary's Hospital, Stratford, E. 15.

NEUROLOGY.

The National Hospital, Queen-square, W.C.—The hospital, with the Convalescent Home at East Finchley and branch at Clapham Park, contains 265 beds and cots The out-patient physicians attend every Monday, Tuesday, Thursday, and Friday at 2 P.M., and the physicians daily. Clinical clerks are appointed under physicians and clinical assistants to out-patient physicians. Post-graduate Courses of Lectures and Demonstrations are held three times every year, usually commencing in January, May, and October, and lasting eight weeks. Special Courses in Neurological Ophthalmology, Neuropathology, and the Anatomy and Physiology of the Nervous System are given. The Pathological Laboratory is available for special work under the Pathologist.

West End Hospital for Nervous Diseases.—This institution is recognised by the University of London as a school of instruction in Neurology for the M.D. degree, Branch III., and for the D.P.M. The Out-patient Department is in Welbeck-street, W.; the In-patient Department is at Gloucester-gate, Regent's Park, and contains 80 beds. Completely equipped with pathological and other special departments, the hospital offers every facility for instruction in Neurological subjects. In conjunction with the Bethlem Royal Hospital, it offers courses of instruction for the D.P.M. Additional series of clinical demonstrations, apart from the general practice of the hospital, are held regularly each session. and the hospital coöperates with the Fellowship of Medicine in the programmes of special post-graduate teaching organised by the Association. Appointments as Hon. Clinical Assistants in the Out-patient Department are open to registered medical practitioners. The Savill Memorial Prize (value £15) and Medal are offered biennially for competition among post-graduate students who have attended the practice of the hospital or any special course. Full particulars may be obtained from Dr. C. C. Worster-Drought, Dean, or J. P. Wetenhall, Secretary, 73, Welbeck-street, W.

Hospital for Epilepsy and Paralysis, &c., Maida Vale, W. (85 beds).—Both in-patient and out-patient departments of this hospital are open free to students as well as to medical graduates. The out-patient department is open every week-day except Saturday at 2 P.M.

HEART AND LUNGS.

Hospital for Consumption and Diseases of the Chest, Brompton.—The hospital contains 333 beds. The Sanatorium at Frimley contains 100 beds and 50 beds for paying patients. Six house physicians reside in the hospital for a term of six months; their duties include attendance in the out-patient department. An additional month may be spent at the Sanatorium. Pupils are admitted to the practice of the hospital. Clinical Demonstrations are given throughout the year by members of the medical staff. Clinical assistants are appointed to the physicians *in the out-patient department* and clinical clerks to the physicians in the wards. The medical practice of the hospital is recognised by the English Conjoint Board and also by the University of London, the Apothecaries' Society, and the Army and Navy and Indian Medical Boards. The hospital is open to post-graduates and students. During the month previous to each conjoint *examination* the *teaching* will be as far as possible for students about to enter for the final examination. The hospital practice is open to post-graduate students.

Mount Vernon Hospital (Incorporated) for Tuberculosis and Diseases of the Lungs and Heart, Northwood; Central Out-patient Department, Fitzroy-square, W.—The hospital contains 150 beds, Medical and Surgical; 50 beds reserved for children requiring surgical aid. Clinical Demonstrations are given by the visiting Medical Staff at the hospital at Northwood. New departments for artificial light treatment have been opened both in the hospital and the *out-patient departments. Clinical assistants* are appointed to physicians in the wards and in the out-patient department.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E. 2.—Tuberculosis Dispensary (Boroughs of Bethnal Green and part Hackney). Special Departments: Surgical, Laryngological, Radiological, *Pathological, Electrocardiographic.* Assistants are appointed to the Clinics, and a limited number of research workers to the Pathological Department. The in-patient staff visit generally in the afternoon; out-patients at 2 P.M. The post-graduate students are admitted on payment of fees which entitle them to attendance at clinics, post-mortem demonstrations, *and operations.* Special demonstration and lecture courses are provided, and a club room. Graduates desiring Assistantships in any department should apply to the head of the Special Department.

National Hospital for Diseases of the Heart, Westmoreland-street, London, W. (founded 1857).—The practice of the hospital, both in the wards and out-patient department, is open daily to post-graduates and *others.* Systematic courses of instruction, with lectures and clinical demonstrations, are arranged during the winter and summer sessions; in addition an intensive course, of a fortnight's duration, takes place in January, July, and October of each year. The hospital is fully equipped with all the modern instruments for the investigation of the diseases of the Cardiovascular system, *and facilities* exist for those requiring practical instruction in Electrocardiography, X Rays, and other graphic methods. Clinical Assistants in the Out-patient Department are appointed from time to time.

DISEASES OF WOMEN AND CHILDREN.

Hospital for Sick Children, Great Ormond-street, W.C. 1. (contains 252 beds).—The practice is open to students of both sexes who have completed four years of medical study and also to qualified medical men and women. The medical staff are recognised by the University of London as teachers in Diseases of Children. Arrangements have also been made with University College Hospital and *the* London School of Medicine for Women for the routine admission of their students of both sexes to clerkships and dresserships in the wards. Appointments are made every three months to eight medical clerkships, which are open to students of the hospital. Clinical instruction is given daily by members of the visiting staff. Clinical Clerks are appointed once a month. In the pathological department facilities are afforded to post-graduates for obtaining theoretical and practical instruction in Clinical Pathology and Bacteriology, and in Medical Biochemistry in the Pathological and Biochemical Laboratories. Courses of eight to ten Lecture-Demonstrations are given at weekly intervals twice a year in both subjects

(Clinical Pathology and Bacteriology, and Biochemistry.) Time spent in clerking and dressing is recognised by the Universities of London, Oxford, and Cambridge, as well as by the English Conjoint Board as part of the final curriculum. These appointments are open to students of all recognised medical schools. In addition, special lectures in post-graduate work are held throughout each term of the year, as well as routine post-graduate instruction daily.

Queen Charlotte's Maternity Hospital (formerly Queen Charlotte's Lying-in Hospital) and Midwifery Training School, Marylebone-road, N.W.—This hospital receives over 2000 patients annually, besides having a large out-patient department. Medical pupils are received at all times of the year. Pupils have unusual opportunities of seeing obstetric complications and operative midwifery, on account of the very large number of primiparous cases—nearly one-half of the total admissions. Clinical instruction is given on the more important cases which present themselves. They also receive valuable instruction in the Antenatal Department, where over 4000 patients attend yearly. Special Lecture-demonstrations are given by members of the staff. Certificates of attendance at this hospital are recognised by all the Universities, Colleges, and licensing bodies. Pupil midwives and maternity nurses are received and specially trained. A Residential College provides accommodation for students and qualified practitioners (both men and women), and is opposite the hospital, with which it is in telephonic communication. Arrangements have been made for Medical Students to receive the preliminary instruction in Practical Midwifery recommended by the General Medical Council.

Royal Waterloo Hospital for Children and Women, Waterloo Bridge-road, S.E.—This hospital, founded at the date indicated by its title, has recently undergone considerable extensions, and has now 130 beds, while the latest buildings include a nurses' home and a new operation theatre. It has a full staff of surgeons, physicians, and gynæcologists, and also special departments. A new orthopædic department is in use, and a new nursing home is in occupation. The physiotherapeutic and electrical department has this year been extended and re-equipped. Particulars of post-graduate courses, which are held from time to time, can be obtained from the Secretary or from the Fellowship of Medicine.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—138 beds and a large out-patient department; the home at Broadstairs has 50 beds. Private wards in the Nurses' Home, named after H.R.H. Princess Mary (Viscountess Lascelles), at 29, Tite-street, adjacent to the hospital. Patients must be under the care of a consultant of one of the hospitals of London, and the question of payment for his fees is arranged between him and the child's parents. Application for admission should be made to the Secretary.

Queen's Hospital for Children (*late North-Eastern Hospital for Children*), Hackney-road, Bethnal Green, E.2.—For the sick children of the poor under 14 years of age. 134 beds in London and 36 at the seaside branch, "Little Folks" Home, Bexhill.—Special departments in Ear, Nose, Throat, Skin and Eye, and Dentistry. A radiologist attends four times weekly. There are massage and light departments, and a special whooping-cough physician. The practice of the hospital is open to students by arrangement with the medical staff, and post-graduate instruction in children's diseases, lectures and demonstrations are given at times notified by the Fellowship of Medicine.

Paddington Green Children's Hospital (46 beds).—This is a small hospital with a large out-patient department and a full staff, with eye, ear, skin, and dental departments. The facilities which it offers for observation of clinical practice are used by the Fellowship of Medicine.

Hospital for Women, Soho-square, W. (80 beds).—The teaching is available for post-graduates only, in limited numbers. Operations take place daily at 2 o'clock except on Saturdays. The X ray department is supplied with the latest installation both for diagnosis and treatment, and experience can also be gained in the treatment of malignant disease by means of radium. Incorporated is the London School of Gynæcology, comprising attendance in out-patient department, operating theatre, clinical lectures, and X ray treatment.

Samaritan Free Hospital for Women, Marylebone-road, N.W. (70 beds).—Qualified practitioners are admitted as clinical assistants to both the in- and out-patient departments. Full particulars in regard to fees may be obtained on application to the Secretary to the Medical Committee at the hospital.

East London Hospital for Children and Dispensary for Women, Glamis-road, Shadwell, E.—136 cots. Clinical instruction is given by the physicians and surgeons to the hospital to students in the fifth year of the curriculum. Two clinical clerkships for qualified or unqualified students are open every three months subject to reappointment if desired. Clinical assistants (qualified men only) are from time to time appointed in the out-patient department. Any additional information may be obtained on applying to the Secretary.

Chelsea Hospital for Women, Arthur-street, Chelsea, S.W.3.—This hospital has about 100 beds, and a certain number are reserved for patients paying £5 5s. a week and small fees to the surgeons for operations. There is a convalescent home of 32 beds at St. Leonards. There is a large out-patient department where the patients are seen at a nominal payment.

The Evelina Hospital, Southwark (76 cots), and The Belgrave Hospital, Clapham-road, also give facilities for the attendance of out-patient practice.

OPHTHALMOLOGY.

Royal London Ophthalmic Hospital (Moorfields, 1804–1899), City-road, E.C.—138 beds. The attendance at Moorfields Eye Hospital is now very large. Operations are performed daily from 10 A.M. to 1 P.M., and four surgeons attend on each day. Students are admitted to the practice of the hospital, and special courses of instruction are given, which extend over a period of five months, by members of the Surgical Staff, beginning in October and March. A composition fee entitles students to a perpetual ticket, and will admit them once to all the lectures and classes and to the examination for the hospital's full certificate. The instruction and classes are arranged so as to meet the requirements for the various diplomas in Ophthalmology, both the preliminary examination in Anatomy, Physiology and Optics, and those subjects required in the second part. Students of the hospital are eligible for the offices of house surgeon or clinical and junior assistants. Junior assistants are appointed every three months.

Royal Westminster Ophthalmic Hospital, Broad-street, Holborn, W.C. (84 beds).—This hospital has recently removed from its original site at Charing Cross to much larger premises, well adapted for teaching purposes. The clinics are held in the afternoons from 1 P.M. Operations are performed daily in the theatre at 3 P.M. Lectures and practical classes in the various branches of Ophthalmology, including Operative Surgery, Bacteriology, and Pathology, are held during the winter and summer sessions at 5 P.M. The practice of the hospital is open to both men and women practitioners, and medical students. Post-graduate students at the hospital are eligible for appointment as house surgeon, assistant house surgeon, refraction assistant (six appointments paid), and senior and junior clinical assistants.

ROYAL EYE HOSPITAL, St. George's-circus, Southwark, S.E.—There are 44 beds and 2 cots. Clinical instruction is given to students and post-graduates daily at 2.30 P.M., and Lectures, Demonstrations, and Laboratory Classes are arranged in preparation for examinations in Ophthalmology. Apparatus has been installed for the Microscopy of the Living Eye. Post-graduate students are eligible for appointment as Clinical Assistants and as Refraction Officers.

CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, St. Pancras, W.C.—This hospital has 40 beds, and clinical teaching is given daily. Classes of instruction in the use of the ophthalmoscope, with demonstrations on cases, and also classes on other subjects, to meet the requirements of the Conjoint Board for the D.O.M.S., and of the University of London for the M.S. in Ophthalmology, are given during the winter months, commencing in October. This school is recognised as a teaching institution by the Universities of London and Oxford, as well as the English Conjoint Board. It receives a portion of the pupils of the University College Hospital for the purposes of ophthalmic training. The Pathological and Bacteriological Laboratories have been rendered available for the use of any ophthalmic surgeons who desire to send specimens for examination. A small fee is charged for a report. A Clinical Demonstration *is held by members of the* staff at the Central London Ophthalmic Hospital at 5 P.M. *on the first Tuesday of every month.* Students of Medicine and Medical Practitioners are admitted *without fee.*

GENITO-URINARY AND VENEREAL DISEASES.

LONDON LOCK HOSPITAL AND HOME. (Founded 1746.)—In the institution at Harrow-road, W., there are 202 beds. In the male department and out-patient department in Dean-street, Soho, W., there are 38 beds. Male and female patients are seen at 91, Dean-street, Oxford-street, W.1, at any time from 9 A.M. until 9 P.M. daily. Intravenous injections are given at every clinic. Irrigations for males are given daily from 8 A.M. to 9 P.M. Female patients and children are seen daily at 283, Harrow-road, Paddington, W.9, from 9 A.M. until 8 P.M. Irrigations for females are given at any time. The hospital is linked up with the Fellowship of Medicine; special courses of lectures are held in May and November each year, and application for tickets should be made direct to the Secretary of the Fellowship. Only a limited number of practitioners and students are permitted to attend the practice of the Female Lock Hospital, and application should be made to Major Corbett (Dean) at the Male Lock Hospital, between the hours of 11 A.M. and 5 P.M., or to the Secretary at the Head office, 283, Harrow-road, W.9.

ST. MARK'S HOSPITAL FOR CANCER, FISTULA, AND OTHER DISEASES OF THE RECTUM, City-road, E.C.1. (Founded 1835.) (62 general beds and 10 private beds.)—For men and women. Operations are performed on Mondays, Wednesdays, and Thursdays at 2.30 P.M. Medical practitioners and students are invited to the operations and to the clinical instruction in the wards and in the out-patient department. Two fortnightly courses held during year in coöperation with the Fellowship of Medicine.

ST. PETER'S HOSPITAL FOR STONE AND OTHER URINARY DISEASES, Henrietta-street, Covent Garden. Established 1860. 30 beds for men and 2 beds for women and children.—The X ray department is diagnostic only. A loan of radium salts for research work was made by the British Empire Cancer Campaign in 1925. Medical practitioners and students are invited to the clinical instructions which are given in the wards and out-patient department daily, excepting that the only out-patient clinic open to medical women is that held at 2 P.M. Fridays for women and children, and to the operations in the theatre on Mondays at 2.30 P.M., and Wednesdays and Fridays at 2 P.M. *Post-graduate Courses of Lectures are arranged through the Fellowship of Medicine from time to time.*

ALL SAINTS' HOSPITAL FOR GENITO-URINARY DISEASES.—The in-patient department, 30 beds, is at *Finchley-road, and the terms of admission are* free or by payment according to means. The out-patient department in the Vauxhall Bridge-road provides clinical instruction through the Fellowship of Medicine.

ORTHOPÆDICS.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, Great Portland-street, W. (200 beds.)—This institution is a good example of the fusion of small and scattered activities for the creation of an effective whole. The three orthopædic hospitals of the metropolis were combined for the formation of this central institution at the instance of the King's Hospital Fund, with the result that the grants from this Fund and the income from subscriptions can now be used to far better purpose and with economy. The hospital has also been approved by the Ministry of Health for the treatment of tuberculosis, the connexion between orthopædics and the therapeutics required in many forms of tuberculosis having become obvious. Country branch at Brockley Hill, Stanmore. (214 beds.)

EAR, NOSE, AND THROAT.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.—The hospital is open daily to all qualified medical practitioners on presentation of their visiting cards. Demonstrations of the cases and clinical instruction are given daily by the chief surgeon of each clinic. Lectures each Friday at 4 P.M. An intensive Course of Lectures with Operative Surgery Class, Peroral Endoscopy Class, and Pathology Class is given twice yearly—in May and October. Preparatory courses in Methods of Examination and Diagnosis at frequent intervals. Consultations on interesting cases take place on the fourth Wednesday in each month at 4 P.M. Clinical Assistants are appointed and are expected to hold office for at least three months. They are required to attend twice weekly at 1.30 o'clock for the afternoon, and at 4.30 o'clock for the evening clinics.

GOLDEN-SQUARE THROAT, NOSE AND EAR HOSPITAL (with which is amalgamated the London Throat Hospital, Great Portland-street).—Clinical instruction in the diagnosis and treatment of disease is given daily in the out-patient department from 2 to 5 P.M., and on Tuesdays and Fridays from 6.30 to 9 P.M. There is an annual out-patient attendance of over 50,000. Minor operations are performed on Mondays, Wednesdays, and Fridays, at 9.30 A.M. New wards and in-patient operating theatres have been opened recently, and the hospital now contains 73 beds. Practitioners and medical students are admitted to the practice of the hospital, and clinical assistants are appointed periodically.

METROPOLITAN EAR, NOSE, AND THROAT HOSPITAL. (Founded 1838.)—The hospital is in Fitzroy-square, W. The Out-patient Department is opened daily (Saturdays excepted) at 2.30 P.M. to all medical practitioners and senior students for acquiring clinical instruction and technical knowledge. Operations upon in-patients are performed on Tuesdays, Wednesdays, and Thursdays at 10 A.M. Clinical Assistants are appointed as vacancies occur, and have responsible duties.

SKIN.

LONDON SCHOOL OF DERMATOLOGY, ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.—In-patient Department (33 beds) at 262, Uxbridge-road, W. Out-patient Clinics are held daily at 2 and 6 P.M. (Saturdays 2 P.M. only), when demonstrations are given on the cases presenting themselves. *The Chesterfield Lectures,* constituting a systematic course in dermatology, are given on Tuesdays and Thursdays at 5 P.M., from October to

March, by the hon. medical staff of St. John's Hospital and the physicians in charge of the Dermatological Departments of the London Teaching Hospitals. The lectures are free to those attending the practice of the hospital and to registered medical students. At the end of the course an examination is held for the Chesterfield Medal in Dermatology, and is open to those who have attended three-quarters of the lectures. The Electrical Department is open daily from 2 to 4 P.M., except on Wednesdays and Saturdays. Laboratory Courses in the Pathology and Bacteriology of the Skin can be arranged.

THE LONDON SKIN HOSPITAL (Fitzroy-square), and the HOSPITAL FOR DISEASES OF THE SKIN (Blackfriars-road), admit students to their practice, which is among out-patients.

CENTRES OUTSIDE LONDON AFFORDING EDUCATIONAL FACILITIES.

Nearly every hospital of a general character in the country having more than 150 beds falls within this category, and certain of them have already been noticed in connexion with the universities to which their clinical practice is attached.

The following alphabetical list includes the provincial hospitals which are recognised by the English Conjoint Board for a part of the required training in medical and surgical practice through clerkships and dresserships.

BATH ROYAL UNITED HOSPITAL, Bath.—This hospital contains 212 beds, 72 of which are situated in Combe Park, Bath, and are for *paying patients* only, and possesses X Ray, Massage, Bacteriological Departments, a Pathological Laboratory, and a fine library. Secretary: Mr. J. M. Sheppard. V.D. Clinics are held on Tuesdays (for women), and on Fridays and Saturdays (for men), at 5 P.M., and Ear, Throat, and Nose Clinics on Thursdays, at 4 P.M.

BEDFORD COUNTY HOSPITAL, Bedford.—This hospital has 111 beds, including 15 beds in the paying wards, X Ray and Pathological Departments. There is in connexion with the institution a convalescent home (20 beds) at Aspley Heath, nr. Woburn Sands. The hospital is approved by the University of London for the M.D. and M.S. Examinations. Secretary: Mr. Beauchamp Wadmore.

BRADFORD ROYAL INFIRMARY, Bradford.—This hospital contains 215 beds and, in addition, has 50 recovery beds at the Woodlands Convalescent Home, Rawdon. There are 4 Honorary Consulting Physicians, 1 Honorary Consulting Surgeon, 1 Honorary Consulting Laryngologist, 1 Honorary Consulting Gynæcologist, 1 Honorary Consulting Pathologist, and 1 Honorary Consulting Dental Surgeon. The Acting Staff consists of 3 Honorary Physicians, 4 Honorary Surgeons, 1 Honorary Radiologist, 1 Honorary Laryngologist, 1 Honorary Ophthalmic Surgeon, 1 Honorary Dental Surgeon, 2 Honorary Assistant Physicians, 2 Honorary Assistant Surgeons, 1 Honorary Assistant Radiologist, 5 Anæsthetists, 1 Pathologist, 1 Resident Surgical Officer, 1 House Physician, and 4 House Surgeons. The material passing through the *surgical* wards consists of major operations, chiefly abdominal and gynæcological work, and affords excellent facilities for either students or post-graduates. There are special clinics for Orthopædic cases and for electrotherapeutic and sunlight treatment. Plans for a new hospital of 360 beds with an additional self-contained block for 70 paying patients have been adopted and building operations have commenced. *Secretary-Superintendent*: Mr. J. J. Barron.

COVENTRY AND WARWICKSHIRE HOSPITAL, Coventry (established 1810).—There are 307 beds available at this hospital at the present time. At the beginning of this year a large house and extensive grounds, situated about 3½ miles from the centre of the city, were purchased, which will be opened at the end of the year as an annexe to the hospital. The building is to be styled the "Alcock" Convalescent Hospital, and will provide for at least another 40 patients. At the main hospital there are separate Medical, Surgical, Maternity, Children's and Accident Wards, also a separate Ophthalmic Block complete with its own theatre. There are separate departments and clinics for Ear, Nose and Throat Diseases; X Ray, Electrical and Sunlight treatment; also V.D. clinics. An up-to-date Pathological Laboratory was *opened early in the year*, and a second general operating theatre.

DERBYSHIRE ROYAL INFIRMARY, Derby.—This is a General Hospital containing 336 beds. It was founded in 1810, and was entirely rebuilt in 1892–94. In recent years there have been numerous alterations and additions to keep pace with modern requirements. The Hospital is built on the pavilion system and provides, in addition to the usual Medical and Surgical blocks, a separate Ophthalmic block of 40 beds, a separate Children's block of 34 beds (Medical and Surgical), Gynæcological Wards, and an Ear, Throat, and Nose Department. There is a large and well-equipped Out-patient Department, also separate Orthopædic, X Ray, Electrical, Pathological, and Venereal Diseases Departments. The Honorary Visiting Staff consists of 2 Honorary Physicians, 3 Honorary Surgeons, 1 Honorary Ophthalmic Surgeon, 1 Honorary Gynæcologist, 1 Honorary Assistant Physician, 1 Honorary Assistant Surgeon, 1 Honorary Pathologist, and 2 Honorary Surgeon Dentists. The salaried Medical Staff consists of a non-Resident Staff of 1 Surgeon-in-charge of X Ray and Electrical Departments, 1 Surgeon-in-charge of Venereal Diseases Department, 3 Anæsthetists, and a Resident Staff of 4 House Surgeons, 1 House Physician, and 1 Assistant House Surgeon and Casualty Officer. Registered Medical Students are admitted to witness the medical and surgical practice on payment of fees. Superintendent and Secretary: Mr. Walter Banks, F.C.I.S.

GLOUCESTERSHIRE ROYAL INFIRMARY AND EYE INSTITUTION, Gloucester.—This hospital, which was granted the title of "Royal" on the occasion of King Edward VII.'s visit to Gloucester in the year 1909, has 140 beds. Secretary: F. J. Symons. An electrical and massage department has been established and venereal clinic opened. Also ear, nose, and throat department, X ray department, ultra-violet ray department, orthopædic department, dental department, and pathological laboratory.

HULL ROYAL INFIRMARY, Hull.—This hospital contains 267 beds, and since its establishment in 1782 has undergone steady additions and improvements, including up-to-date Ophthalmic, Radiological Nose, Throat and Ear, Dental, V.D., Violet Rays and Pathological Departments. Recent extensions include a new Operating Theatre, Nurses' Home, and extensions to the old X Ray, Electrical, and Out-patient Departments. Work is in progress on the erection of a block of 100 beds, being the first instalment of a new 500-bed hospital which it is proposed eventually to build on a site which has been given the the Infirmary at Sutton-on-Hull. The Honorary Staff consists of 2 Consulting Physicians, 3 Consulting Surgeons, 2 Consulting Ophthalmic Surgeons, 3 Physicians, 4 Surgeons, 1 Ophthalmic Surgeon, 1 Aural Surgeon, 1 Radiologist, 1 Pathologist, 2 Assistant Physicians, 2 Assistant Surgeons, 1 Assistant Ophthalmic Surgeon, 1 Assistant Aural Surgeon, 1 Dental Surgeon, 1 Assistant Dental Surgeon, 4 Anæsthetists, 1 Officer-in-charge of V.D. Department. Resident Staff: 1 House Physician, 1 House Surgeon, 1 Assistant House Physician, 2 Assistant House Surgeons, 1 Assistant Surgeon to Special Departments, 1 Casualty Officer. An annexe at Withernsea has accommodation for 30 patients.

KENT AND CANTERBURY GENERAL HOSPITAL, Canterbury.—The hospital contains 120 beds. Pupils of the staff are admitted to the practice of the hospital. Operations daily. There is an Ophthalmic Department with two wards for in-patients, a Venereal Clinic, an Orthopædic, Massage, and Electrical Department, and Actinotherapeutic Department. Secretary: Mr. W. T. Southwood.

Leicester Royal Infirmary, Leicester.—At the *General Infirmary* there are 333 beds, and at the *Children's Hospital in connexion*, 70; venereal diseases, 17; total 420 beds. A reconstruction scheme has been carried out, and £250,000 spent on bringing the accommodation of the institution to a modern standard of efficiency. This scheme has included the provision of two modern operating theatres, two new wings, and self-contained out-patients' department. The Children's Hospital has been reconstructed and enlarged by the addition of a third ward at a cost of £14,500. Pathological Laboratories and post-mortem rooms were rebuilt at a cost of £11,000, also an orthopædic out-patient department at a cost of £9500, £5000 of which was provided by the Freemasons of the province as their war memorial. The Nurses' Home has recently undergone enlargement by 60 bedrooms, and now provides for 160 nurses and staff. The 150th anniversary of the Institution has recently passed, and a sum of £100,000 was raised in commemoration. Important and extensive improvements are (1928) being carried out. An old central wing erected in 1861 is being replaced by a new wing of three wards, at a cost of £48,000. Other structural improvements are being effected at a cost of £25,000, comprising reconstruction of the kitchens, new temporary ward of 30 beds, and a new venereal disease department. There are ten resident salaried medical officers—viz., four house surgeons, two house physicians, two anæsthetists, and two dressers. Most of the posts are filled half-yearly and afford exceptional opportunities for post-graduate experience and senior students. Dressers are given an honorarium. A post-graduate course of lectures is arranged annually by the Leicester Medical Association, and also clinical classes are held for graduates preparing for M.D. and M.R.C.P. New accommodation for resident medical officers has been erected.

Norfolk and Norwich Hospital, Norwich.—This hospital has at present 338 beds. There is a convalescent home with accommodation for 35 patients at Cromer. The Honorary Medical and Surgical Staff consist of 2 Consulting Physicians, 3 *Consulting* Surgeons, 1 Consulting Radiologist, 1 Consulting *Ear, Nose and Throat* Surgeon, 3 Physicians, 3 Surgeons, 1 Assistant Physician, 3 Assistant Surgeons, 1 Surgeon, Ear, Nose and Throat Department: 2 Ophthalmic *Surgeons*, 1 Radiologist, 1 Pathologist and 2 Dental *Surgeons*. There are 3 Honorary Anæsthetists and Honorary Assistants to the Ear, Nose and Throat Department, the X ray Department, Ophthalmic Department, and Cardio-Vascular Clinic. Other medical officers are: 1 Assistant Pathologist and 1 Assistant to the Venereal Diseases Department. The Resident Medical Staff consists of 1 House Physician, 3 House Surgeons, 1 House Surgeon to the Ear, Nose, Throat, and Eye Department, and 1 Casualty Officer. A private patients' home has recently been opened. Students are admitted to the practice of the *Hospital* for a fee of £5 5s. for six months. House Governor and Secretary: Mr. Frank Inch.

Northampton General Hospital, Northampton.—Two new wings were opened in 1904 and the old buildings entirely renovated and rearranged. In 1926 a new isolation block of 30 beds was opened. The number of beds is 230. *Non-resident* pupils receive and have every opportunity of *acquiring a* practical knowledge of their profession Pupils can be received at any time. There is an up-to-date Pathological Laboratory: also X Ray and Therapeutic Department and V.D. Clinic.

North Staffordshire Royal Infirmary, Hartshill, Stoke-on-Trent.—The New Infirmary, opened in 1869, is built on the pavilion plan, has accommodation for about 316 patients, *including* Children's wards, a Bacteriological and Pathological department, and a department for the treatment of Diseases of the Eye, X Ray and Electrical department (including Ultra-Violet Ray Lamps); Cardiographic department, a department for the treatment of Diseases of the Ear, Nose, and Throat, an Orthopædic department, an Electrocardiograph department, and Venereal Diseases clinics; so that there are excellent facilities for acquiring a practical knowledge of the profession. During the last four years the sum of £170,000 has been spent on new buildings and alterations. The extensions comprise a new ward block also containing new X Ray and Orthopædic departments with connecting corridors to the existing Infirmary, large extensions to the nurses' home, a new boiler house, new chimney stack, and a new laundry. The whole institution is now equipped thoroughly. Secretary and House Governor: Mr. W. Stevenson.

Nottingham General Hospital.—There are at this hospital 357 beds available for medical and surgical patients, and 54 beds are in the detached branch known as "The Cedars" Branch of the General Hospital. The Medical and Surgical Staffs consist of 1 Honorary Consulting Physician, 2 Honorary Consulting Surgeons, 1 Honorary Consulting Physician in Venereal Diseases, 3 Honorary Physicians, 4 Honorary Surgeons, 2 Honorary Assistant Physicians, 2 Honorary Assistant Surgeons, 2 Honorary Aural Surgeons, 1 Honorary Dermatologist, 2 Honorary Anæsthetists, 2 Honorary Assistant Anæsthetists, 1 Honorary Surgeon Dentist, 1 Honorary Medical Officer in Charge of X Ray and Electro-therapeutic department, and 1 Pathologist. The Resident Medical Staff consists of 2 House Physicians, 4 House Surgeons, 1 Aural House Surgeon, and 1 Casualty Officer. The special departments are the Ear, Nose and Throat, Skin, Dental, Massage and Exercise, X Ray, Orthopædic, Electrotherapeutic, Ultra-Violet Light. *House Governor and Secretary*: Mr. P. M. MacColl.

Royal Berkshire Hospital, Reading.—This hospital, which *contains* 237 *beds*, was enlarged in 1912, and includes an Out-patient Department, a Casualty Department, an X Ray Department, Electrotherapeutic and Massage Department, an Orthopædic Department, a V.D. Clinic, a Laboratory, an Eye Theatre, Eye Wards, a Maternity Ward, and two Motor and one Horse ambulances. The hospital is approved by the General Nursing Council as a Training School for Nurses. Post-graduate Lectures are given, and by the Ministry of Health for V.D. Treatment.

Royal Devon and Exeter Hospital, Exeter.—The hospital contains 225 beds (including special children's wards) and has a good library, museum post-mortem room, and pathological laboratory. Attendance on the practice of this hospital qualifies for all the examining boards. There is also a Private Nursing Staff attached to the hospital. For particulars as to fees, &c., apply to the Matron. A new wing was added in 1897 and the "Victory" wing for the treatment of discharged disabled soldiers and sailors completed and opened in 1922. Arrangements may be made by which gentlemen in practice desiring to increase their qualifications may have the use of the museum and library and other facilities and by which students may attend midwifery. A new Operating Theatre was opened *in* 1906 (the gift of Mrs. Nosworthy of Dawlish, Devon). The Electrical Treatment Department (the gift of Mrs. M. A. Sanders) was opened in 1907 by Lady Duckworth-King. This department was enlarged in 1925 to meet the ever-increasing work, and now forms *one of the most* important sections of the hospital. A department was opened in 1917 for the treatment of genito-urinary diseases; there are three sessions per week, two *for men* at 3 P.M. and 7 P.M., and one for women at 3 P.M.

Royal Hants County Hospital, Winchester.—158 civilian beds. Secretary: Mr. Herbert Maslen.

Royal Hospital, Portsmouth.—180 beds. There are X Ray and Massage Departments.

Royal Salop Infirmary, Shrewsbury.—This hospital has 150 beds. In-patients, 1565; out-patients, 1448; out-patients' attendances, 21,387; accidents and casualties, 3540; dental cases, 288. Secretary-Superintendent: J. W. Noble. A New Wing for the reception of Women and Children, capable of accommodating some 40 patients, has now been erected.

Royal South Hants and Southampton Hospital, Southampton.—This hospital contains 130 beds, but will be increased to 214 beds within the next few months, with every facility for clinical instruction. Special Departments: Ear, Nose, and Throat; X Ray; Massage and Electricity; Ultra-Violet Ray; Venereal Diseases. Large Out-patient Department.

Royal Sussex County Hospital, Brighton (225 beds).—This hospital affords ample facilities for students, possessing a large out-patient department, including Ophthalmic, Dental, Dermatological, Gynæcological, X Ray, and Orthopædic sections, and a well-appointed clinical research and bacteriological department. The hospital does not take resident pupils, but out-pupils may attend the practice of the hospital for any period not exceeding two years, on payment in advance of a fee, not exceeding 20 guineas, as the Board of Management shall direct.

Salisbury General Infirmary, Salisbury.—This hospital contains 142 beds. Maternity and antenatal and ophthalmic wards; maternity and child welfare clinic.

South Devon and East Cornwall Hospital, Plymouth.—This hospital has 185 beds (including 10 for venereal diseases in a separate building). Special departments include Pathological, X Ray, Deep-Therapy, Cardiographic, Ultra-Violet Rays, Electrotherapeutic, and Orthopædic: also medical and surgical out-patients. Pensioners are received as in-patients, and are also treated as out-patients.

Staffordshire General Infirmary, Stafford (established 1766).—This hospital has 100 beds.

West of England Eye Infirmary, Exeter.—64 beds. Students of the Exeter Hospital can attend the practice of the Eye Infirmary. A ward is set aside for newly-born babies suffering from infectious eye diseases. Mothers with babies are accommodated.

Wolverhampton and Staffordshire Hospital, Wolverhampton (210 beds).—Special departments for Children, Infectious cases, Gynæcology, Ear, Throat, and Nose Diseases, Electrotherapeutic and X Rays, Orthopædics, Artificial Sunlight, Venereal Disease, Pathological Laboratory, Dentistry, and Electrocardiographic Installation. There is an excellent library. The resident officers are a resident surgical officer, resident medical officer, two house surgeons, and resident anæsthetist. Pupils are allowed to witness the whole of the practice of the hospital and to be present at operations and have every opportunity of acquiring a practical knowledge of their profession. A course of Practical Pharmacy is given by the dispenser. Fees on application. Applications should be made to the Honorary Secretary of the Medical Committee.

Worcester General Infirmary, Worcester.—This hospital has 132 beds. Pupils are taken by members of the Honorary Medical and Surgical Staff. New X Ray and Electrical and Wolfram Arc Light, Ear, Nose and Throat, and Orthopædic Departments have been erected and are now in use. Additional accommodation for the Honorary Staff and Out-patients and also an Outdoor Shelter in connexion with the Children's Ward have been built as a memorial to King Edward VII., and fire-escape staircases erected.

York County Hospital, York.—This hospital contains 180 beds. There are balconies for outdoor treatment, two installations of X ray apparatus, electrotherapeutic and massage department, actinotherapy installation, Zünd-Burguet apparatus for treatment of chronic deafness, and clinical laboratory. A Venereal Diseases Clinic is held.

These hospitals vary much in size and scope, and obviously offer, for reasons of geography, many separate appeals, so that no detailed information upon any particular points in reference to any particular institution would be of service to any large group of students. It is unnecessary to point out to the general practitioners in the neighbourhood the advantages to be obtained from the post-graduate facilities offered to them by the hospital in their midst, and it is gratifying to know that a far wider use is being made of these facilities than was formerly the case.

Medical students completing their curriculum by attendance at authorised courses in these hospitals must ascertain, by communication with the Secretary, information concerning fees and other details.

II.—SCOTLAND.

THE UNIVERSITIES.

UNIVERSITY OF EDINBURGH.

Four Degrees in Medicine and Surgery are conferred by the University of Edinburgh—*viz.*, *M.B.*, *Ch.B.*, *M.D.*, and *Ch.M.* The degree of *Ch.B.* shall not be conferred on any person who does not at the same time obtain the degree of *M.B.*, and the degree of *M.B.* shall not be conferred on any person who does not at the same time obtain the degree of *Ch.B.* No one is admitted to the degrees who has not been engaged in Medical and Surgical study for five years

Candidates for the degrees of M.B. and Ch.B. must have attended for at least three academic years the medical and surgical practice either of the Royal Infirmary, Edinburgh, or of a general hospital elsewhere which accommodates not fewer than 80 patients and possesses a distinct staff of physicians and surgeons. They must have attended courses of instruction in Clinical Surgery and Clinical Medicine each of nine months, and courses of instruction in all the subsidiary subjects. They must have attended a course of instruction in Clinical and Practical Midwifery and have personally conducted 12 cases of labour.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the following regulations have effect:—Three of the five years of medical study must be spent in the University of Edinburgh. The remaining two years may be spent in any University of the United Kingdom, or in any Indian, Colonial, or Foreign University recognised for the purpose by the University Court, or in such medical schools or under such teachers as may be recognised for the purpose by the University Court.

Women are admitted to graduation in medicine under the same conditions as men.

Bachelors of Medicine and *Bachelors of Surgery* may proceed to the degrees of *Doctor of Medicine* and *Master of Surgery* after they have spent one year in the medical or surgical wards respectively of a hospital, or the Military or Naval Medical Services, or in scientific work bearing directly on their profession, or two years in practice. In each case an examination must be passed and a thesis submitted for approval of the Faculty.

Post-graduate Instruction.—The University takes part in the Courses given under the auspices of the Edinburgh Post-graduate Courses in Medicine. In the departments of the Faculty of Medicine provision is made for research by students of graduate standing. In the University laboratories facilities will be provided for candidates for the Degree of Ph.D. whose applications to engage in research have been accepted by the Senatus.

In connexion with the University and Royal Colleges Post-graduate Instruction is given each year, chiefly in the Summer Vacation (July–September). Special Courses are arranged for, and particulars may be had on application to the Hon. Secretary, Post-graduate Courses in Medicine, University New Buildings, Edinburgh.

The University of Edinburgh is especially rich in scholarships and prizes in medical subjects. Full particulars concerning these, as well as concerning the fees at different stages, can be obtained from the Dean of the Medical Faculty.

ROYAL INFIRMARY, Edinburgh.—994 beds, including 42 cots for children. The clinical work of the Edinburgh student is done at the Royal Infirmary. Courses of Clinical Medicine and Surgery are given by the physicians and surgeons to male and female students. Special instruction is given on Diseases of Women, Physical Diagnosis, Diseases of the Skin, Diseases of the Eye, the Ear, the Larynx, and the Teeth. Separate wards are devoted to Venereal Diseases, Diseases of Women, Diseases of the Eye, the Ear, Throat and Nose, and the Skin, and also to cases of Incidental Delirium or Insanity. There is also a large and complete Radiological Department. Post-mortem examinations are conducted in the anatomical theatre by the pathologist and his assistants, who also give practical instruction in Pathological Anatomy and Histology.

The appointments are: 1. Resident physicians and surgeons are appointed and live in the house free of charge. The appointment is for six months, but may be renewed at the end of that period by special recommendation. 2. Non-resident house physicians and surgeons and clinical assistants are appointed for six months. The appointment may be renewed for a like period by special recommendation. 3. Clerks and dressers are appointed by the physicians and surgeons. These appointments are open to all students and junior practitioners holding hospital tickets. 4. Assistants in the Pathological Department.

Facilities are given in connexion with the Post-graduate Courses arranged by the Edinburgh University and the two Royal Colleges jointly.

ROYAL HOSPITAL FOR SICK CHILDREN, Sciennes-road, Edinburgh.—120 beds, and fitted with every modern improvement. A fully equipped out-patient department (medical and surgical) is conducted daily. Systematic courses of instruction, which qualify for graduation in the Edinburgh University and elsewhere, are given thrice throughout the year by the staff. Each course consists of 50 meetings and combines *medicine* and surgery. Post-graduate Courses of Lectures are held during the summer *vacation*. Full particulars with regard to teaching can be obtained from the Dean's office, University New Buildings, Edinburgh.

EYE, EAR, AND THROAT INFIRMARY OF EDINBURGH (with which is incorporated the Edinburgh Eye Dispensary), 6, Cambridge-street, Lothian-road.—Clinical Lectures and Instruction are given in this institution, which is open at 1 o'clock daily for out-door patients for Eye Diseases; Mondays, Thursdays, and Saturdays at 12 noon, and Tuesdays and Fridays at 4 P.M. for outdoor Ear, Nose, and Throat Patients. Patients whose diseases require operations or extra care are accommodated in the house (10 beds). Practical Ophthalmoscopic Classes may be arranged, and Clinical Assistants are appointed from time to time. A Post-graduate Course in *Diseases of the* Ear, Nose, and Throat is held each academic term, commencing in May, October and January, and continuing for six weeks. The next course commences in October. The class meets at 5 P.M. on Tuesdays and Fridays, and the instruction, which is practical, is supplemented by lantern demonstrations. Full particulars from the Secretary, 32, Charlotte-square.

UNIVERSITY OF GLASGOW.

The University of Glasgow is both a teaching and a degree-granting body, but admits to graduation only candidates whose preliminary examination and course of study conform to its own regulations. Within certain limits instruction given by recognised medical schools and teachers may be accepted, but not less than one-half of the subjects other than clinical must be taken in this or some other recognised university, and at least two years of the course must be taken in Glasgow University. Seven degrees, open both to men and women, are conferred: *M.B.* and *Ch.B.* (always conjointly), *M.D.* and *Ch.M.*; *B.Sc.* in Public Health; *D.Sc.* in Public Health; *B.Sc.* in Pharmacy; and *Ph.D.* in the Faculty of Medicine. A Diploma in Public Health (*D.P.H.*) is also granted.

All information as regards the extent and standard of the Preliminary Examination may be obtained by application to the Secretary, Scottish Universities Entrance Board, 81, North-street, St. Andrews.

For the degrees of M.B. and Ch.B. a curriculum of five years is required. The candidate must attend a course or courses of instruction in each of the following subjects of study, extending over not less than the number of terms specified in each case, and including such class examinations as may be prescribed in connexion with the several courses:—Chemistry (including Organic Chemistry), two terms; with Practical Chemistry, one term; Physics (with practical work), one term; Botany (with practical work), one term; Zoology (with practical work), one term; Anatomy and Practical Anatomy, five terms; Physiology and Practical Physiology, three terms; Materia Medica and Therapeutics (together or separately), each subject, one term; Pathology and Practical Pathology, three terms; Medical Jurisprudence and Public Health (together or separately), each subject, one term; Midwifery and Diseases peculiar to Women and to Infants, two terms; Surgery, two *terms*; Medicine, two terms. Candidates must attend for at least three years the Medical and Surgical Practice of a recognised hospital accommodating at least 80 patients and having a distinct staff of physicians and surgeons. At least nine months' hospital attendance is required on both Clinical Surgery and Clinical Medicine with nine months more of general hospital practice: the student must have acted for six months as clerk in medical and dresser in surgical wards, and must have had six months' outdoor practice; he must also have *attended a course* of Mental Diseases and of Practical Pharmacy (25 meetings), must have been properly *instructed* in Vaccination at a public vaccination station, and must have attended at least 20 *cases* of labour and the Practice of a Lying-in Hospital. The University also requires further study in various special subjects: Ophthalmology, Diseases of the Ear, Diseases of the Throat and Nose, Venereal Diseases, Tuberculosis, Fevers, *Vaccination*. The *final* year consists of three intensive terms of study one devoted to Midwifery and Diseases of Women, one to Surgery, and one to Medicine.

There are four Professional *Examinations*, the first comprising Botany, Zoology, Physics, and Chemistry; the second comprising Anatomy and Physiology; the third comprising Materia Medica and Therapeutics and Pathology; and the fourth or final, comprising Medical Jurisprudence and Public *Health*, Surgery and Clinical Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and the Diseases Peculiar to Women and to Infants.

The degrees of M.D. (Doctor of Medicine) and Ch.M. (Master of Surgery) are granted to candidates, not under 24 years of age, who have previously obtained the double bachelorship on completing examinations, in Clinical Medicine for M.D. and in Surgical Anatomy, operations on the dead body, and *Clinical* Surgery for Ch.M. The higher degree of Doctor of Philosophy (*Ph.D.*) is also conferred *in* the Faculty of Medicine. Candidates must already have obtained a degree (or equivalent diploma) from an approved University or College and must prosecute a course of special study or research for two or three years and given evidence of satisfactory progress. A thesis must be presented for approval by the Senate on the recommendation of a Special Committee. The candidate may be required to undergo an oral or other examination on the subject matter of the thesis.

Post-graduate Medical Teaching is available under the auspices of Glasgow Post-Graduate Medical Association, which is representative of practically all the Teaching Institutions in Glasgow. Weekly demonstrations for practitioners are given throughout the winter and spring, and comprehensive courses of instruction during the summer and autumn. There is a General Medical and Surgical Course during the last two weeks of August and the first two weeks of September. This is a whole-time course and includes most of the subjects of interest to the general practitioner. The forenoons are occupied with General Medicine and Surgical Diagnosis and Minor Surgery in the Royal Infirmary and in the Victoria Infirmary. In the afternoons special subjects are dealt with in some of the special hospitals or in the special departments of the general hospitals—two subjects each afternoon. On the four Saturday forenoons Tuberculosis and Infectious Fevers are demonstrated at Ruchill Fever Hospital. Arrangements have also been made whereby a limited number of graduates may become attached to wards or out-patient departments nominally as clinical assistants for definite periods throughout the year. As such they work under the direct supervision of the physician or surgeon in charge, and carry out such detailed investigations as directed. Further information may be obtained from the Secretary of the Association, 9, Woodside-terrace, Glasgow.

The great majority of the students take their hospital course at the Western, Royal, and Victoria Infirmaries, and at the district hospitals of Glasgow Parish Council, where clinical instruction is given by professors of the University and others. Clinical instruction on Fevers is given at Ruchill and Belvidere Hospitals, while special courses, largely of a practical nature and embracing work in Hospital or Asylum wards, are conducted by University Lecturers on the Ear, the Throat and Nose, Dermatology, Ophthalmology, Venereal Diseases, Tuberculosis, Insanity, and Electro-diagnosis and Therapeutics.

ROYAL INFIRMARY, Glasgow.—The ancient connexion between the University of Glasgow and the Royal Infirmary was revived in 1911, when four University Chairs and several University Lectureships were established at the Infirmary. New Lectureships in Materia Medica and Pathological Biochemistry were established recently, and this year a lectureship in Bacteriology has been founded. St. Mungo's College which embraces and continues the original Royal Infirmary Medical School, is situated in the infirmary grounds. The infirmary has, including the Ophthalmic Department, over 800 beds. There are special wards for diseases of women, of the throat, nose, and ear, skin, eye, burns, septic cases, and biochemical investigation. The wards are open to Women Students. In addition to the large medical and surgical departments, there are departments for special diseases— viz., diseases of women, of the throat and nose, of the ear, of the eye, of the skin, and of the teeth. Five house physicians and ten house surgeons, who board in the hospital free of charge, are appointed every six months; also five non-resident house physicians, eight non-resident house surgeons, and one non-resident dental house surgeon. Clerks and dresses are appointed by the physicians and surgeons. As a large number of cases of acute diseases and accidents of a varied character are received, these appointments are very valuable and desirable. There is a modern and fully equipped Electrical Pavilion and Massage Department, and year by year the latest and most approved apparatus for diagnosis and treatment has been added. Post-graduate Classes are held during August and September in Clinical Medicine, Clinical Surgery, Clinical Gynæcology, Diseases of the Skin, Biochemistry, Diseases of the Throat, Nose and Ear, and in Diseases of the Eye. Tutorial Classes for senior students are also held in August and September.

For information regarding fees and other particulars, application should be made to the Superintendent.

GLASGOW WESTERN INFIRMARY.—This hospital of 600 beds adjoins the University. Special wards are set apart for Diseases of Women, Throat, Nose, and Ear, and for Affections of the Skin. In the out-patient department there are special clinics for Diseases of Women and for Diseases of the Throat, Ear, Teeth, Skin, Venereal Disease, and Electrotherapeutics. The Clinical Courses are given by the physicians and surgeons, each of whom conducts a separate class, and students require to enter their names at the beginning of the session for the class which they propose to attend. Special instruction is given to junior students by tutors or assistants, and clinical clerks and dressers are selected from the members of the class. All the courses of clinical instruction are recognised by the University of Glasgow and the other boards in the kingdom. In the Pathological and Bacteriological Departments the courses are both systematic and practical, and extend through the winter and following summer; these are likewise recognised by the University for graduation. In addition Post-graduate Courses are held. Eighteen resident assistants are appointed annually, without salary, from those who have completed their course. In the Clinical Laboratory students receive laboratory instruction from the lecturer on clinical methods. A School of Massage, Medical Electricity, and Swedish Remedial Exercises has been established to qualify for the Certificate of the Chartered Society of Massage and Medical Gymnastics. Secretary: J. Matheson Johnston, C.A., 87, Union-street.

VICTORIA INFIRMARY, 67, Carlton-place, Glasgow.—This institution, which has 380 beds, is the third of the extensive general hospitals in Glasgow to afford opportunity for clinical instruction to students. In addition to a full general staff there is a clinical research laboratory with pathologists and bacteriologists attached, radiological and dental instructors, and a full assortment of specialists. The Bellahouston Dispensary, also with a clinical staff, is conducted in connexion with the Victoria Infirmary. For further particulars of the clinical practice application should be made to the Secretary and Treasurer, Mr. John W. Robson.

THE ANDERSON COLLEGE OF MEDICINE, Dumbarton-road, Glasgow, W.1.—Courses are given which qualify for all the licensing boards and for the Universities of Oxford, Cambridge, London, Durham, Edinburgh, and Glasgow (the latter two under certain conditions). Extensive accommodation is provided for Practical Anatomy, Practical Chemistry, Practical Botany, Practical Zoology, Practical Physiology, Practical Pharmacy, Operative Surgery, and Public Health. Ample provision has also been made for the comfort of students. Women students are admitted on the same terms as men, and the Carnegie Trust extends its benefactions to students of the College. (Full particulars may be obtained from the Carnegie Trust Offices, Merchants' Hall, Edinburgh.)

Candidates for the L.D.S. can obtain the full medical curriculum in Anatomy, Chemistry, Physiology, Surgery, Practice of Medicine, and Materia Medica. The courses special to Dentistry are conducted at the Dental Hospital, Glasgow.

Communications relating to the College to be addressed to the Secretary of the Medical Faculty. Communications relating to the Preliminary Examination in General Education to be addressed to the Educational Institute Office, 47, Moray-place, Edinburgh; and relating to the Triple Qualification and to the Dental Qualification to be addressed to Royal Faculty Hall, 242, St. Vincent-street, Glasgow.

QUEEN MARGARET COLLEGE (Women's Department of the University).—This is an integral part of the University of Glasgow. The classes are taught by professors of the University and other lecturers appointed by the University Court, and it is governed by the University Court and Senate. The curricula, regulations, and fees are the same as those of the male students, and the University degrees are open to women on the same conditions as to men. The school of medicine is a special feature of the College, and gives full preparation for the medical degrees of the University. The women students attend classes in the various University Buildings at Gilmorehill and Queen Margaret College, the Royal Infirmary, the Western Infirmary, and the Victoria Infirmary. Facilities for clinical work are given in the Royal, Western and Victoria Infirmaries, in the Maternity, Royal Sick Children's, and other hospitals. The Arthur Scholarship is open every third year to students of first year; other Bursaries are open in Arts and Medicine, and women are admitted to certain University bursaries and fellowships.

ST. MUNGO'S COLLEGE AND GLASGOW ROYAL INFIRMARY.—The classes in St. Mungo's College qualify for the medical qualifications of the English, Scotch, and Irish Conjoint Boards, for the dental diplomas of the English, Irish, and Scottish Boards and, under certain conditions, for the various universities, including the University of London. Students who have fulfilled the conditions of the Carnegie Trust are eligible for the benefits of this Trust during the whole course of their studies at St. Mungo's College.

Further particulars can be obtained from a syllabus which may be procured free on application to the Secretary of the Medical Faculty, 86, Castle-street, Glasgow.

ROYAL HOSPITAL FOR SICK CHILDREN, St. Vincent-street, Glasgow.—This institution consists of: (1) a hospital at Yorkhill containing 275 cots, built on an elevated and central site close to the University, and opened in July, 1914; (2) a Dispensary, or Out-patient Department, in West Graham-street, opened in October, 1888; and (3) a country branch at Drumchapel, Dumbartonshire, containing 30 cots, opened in 1903. Children treated must not be over 13 years of age, nor suffer from infectious diseases. In 1927 there were 7143 patients treated in the wards, and the number of attendances of out-patients was 83,591. There are one professorship and three lectureships in the University of Glasgow in connexion with the hospital, one professorship and one lectureship on the Medical Diseases of Infancy and Childhood, one lectureship on Surgery and Orthopædics in Relation to Infancy and Childhood, and one lectureship on Bio-chemistry in relation to Infancy and Childhood. The lectures are both systematic and clinical, but particularly and chiefly the latter. In addition special facilities are given for post-graduate study.

Full information may be obtained from the Medical Superintendent.

GLASGOW ROYAL MATERNITY AND WOMEN'S HOSPITAL, Rottenrow.—114 beds. A Maternity and Child Welfare Centre has been established consisting of a complete In-door and Out-door Antenatal Department and an Infant Consultation Clinic. A new research laboratory is now open. Full particulars as to fees and accommodation may be obtained from the House Superintendent at the hospital.

ROYAL SAMARITAN HOSPITAL FOR WOMEN, Glasgow. Increased to 160 beds by building extensions completed in 1927. It offers excellent facilities for clinical instruction in the diseases peculiar to women. Lectures and clinical demonstrations are given by members of the surgical staff to students and to post-graduates; and the hospital is represented on the Board of the Glasgow Post-Graduate Medical Association formed for coördinating post-graduate medical teaching in all the hospitals. The Royal Samaritan Lectureship in Gynæcology is a University Lectureship associated with the Hospital.

For further information, application may be made at the Hospital, or to the Secretary, 149, St. Vincent-street, Glasgow.

GLASGOW LOCK HOSPITAL, 41, Rottenrow, Glasgow. Contains 80 beds for the treatment of females suffering from Venereal Diseases. There is also a Labour Ward, and a well-equipped Dispensary for out-patient attendances. There is a Lecture Room and a Laboratory, equipped with modern appliances, where University classes on the subject are dealt with. Post-graduate classes are also held. Recently the hospital has been completely renovated and modernised. Full information from the Secretary and Treasurer, Mr. J. Neilson Gray, LL.B., 65, Bath-street, Glasgow.

GLASGOW OPHTHALMIC INSTITUTION, 126, West Regent-street, and 131, Wellington-street (30 beds and six cots).—This institution is administered by the Royal Infirmary. Clinical and systematic courses of lectures for students during the winter and summer sessions. Operations on Wednesdays and Fridays. Post-graduate classes and demonstrations are arranged during the summer. Secretary and Cashier: R. Morrison Smith, C.A., 135, Buchanan-street, Glasgow.

GLASGOW EYE INFIRMARY, Berkeley-street and Charlotte-street.—The wards and dispensary are recognised by the University of Glasgow for the purpose of instruction in ophthalmology for graduation in medicine, and by the Royal Colleges of Physicians and Surgeons of England for the Diploma in Ophthalmic Medicine and Surgery. A Venereal Centre has been established, and a Branch Dispensary has been opened in Clydebank. Post-graduate Classes are held. Secretary and Acting Treasurer, Mr. Harold John Black, 171, West Regent-street, Glasgow.

GLASGOW EAR, NOSE, AND THROAT HOSPITAL, 306, St. Vincent-street (52 beds).—At out-patient and in-door departments clinical instruction is given. Post-graduate Courses are held during the year. Secretary: D. N. Mackay, 144, St. Vincent-street, Glasgow.

UNIVERSITY OF ST. ANDREWS (UNITED COLLEGE ST. ANDREWS AND UNIVERSITY COLLEGE, DUNDEE).

Four Degrees in Medicine and Surgery are conferred by the University of St. Andrews—viz., *M.B.*, *Ch.B.*, *M.D.*, *Ch.M.*, a Diploma in Public Health, and Diploma in Dental Surgery (*L.D.S.*).

The extent and standard of the Preliminary Examination is determined by the Scottish Universities Entrance Board constituted under Ordinance No. 70 of the Scottish University Courts (General No. 3—Regulations as to Admission to the Scottish Universities for purposes of graduation), in accordance with the terms of that Ordinance. A degree in Arts or in Science in any of the Universities of the United Kingdom and in some colonial and foreign universities exempts. The Preliminary Examination for graduation in Medicine and Surgery, Arts or Science, of the University of St. Andrews is accepted as equivalent to the Registration Examination required by the General Medical Council (the certificate to include the required subjects). Also the Final Examination for a degree in Arts or Science.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A pre-registration examination is held in Physics and Chemistry. Candidates must have been engaged in medical study for at least five years after registering as a medical student. In each of the first four years the candidate must have attended at least two courses of instruction in one or more of the subjects of study specified below, each course extending over a session of not less than five months, either continuous or divided into two terms, or, alternatively, one such course along with two courses, each extending over a session of not less than two and a half months. During the fifth or final year the candidate shall be engaged in clinical study for at least nine months at the Infirmary of Dundee or at one or more of such public hospitals or dispensaries, British or foreign, as may be recognised for the purpose by the University Court. The candidate must have received instruction in each of the following subjects of study, including such examinations as may be prescribed in the various classes—viz., Anatomy, Practical Anatomy, Chemistry, Materia Medica, Physiology, or Institutes of Medicine, Practice of Medicine, Surgery, Midwifery and the Diseases peculiar to Women and Infants, Pathology, Bacteriology, Practical Chemistry, Physics, Elementary Botany, Elementary Zoology, Practical Physiology, Practical Pathology, Forensic Medicine, and Public Health. The candidate must have attended for at least three years the Medical and Surgical Practice either of the Infirmary of Dundee or of a General Hospital elsewhere with not fewer than 80 patients, with a distinct staff of physicians and surgeons, and recognised for the purpose by the University Court. Additional subjects of study are Practical Pharmacy, Mental Diseases, Practical Midwifery, Operative Surgery, Vaccination, Children's Diseases, Fevers, Ophthalmology, Diseases of the Ear, Throat, and Nose, Anæsthetics, Dermatology, and Post-mortem Examinations.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the following regulations shall have effect:—1. Two of the five years of medical study must be spent in the University of St. Andrews. 2. The remaining three years may be spent in any University of the United Kingdom or in any Indian, Colonial, or Foreign University recognised for the purpose by the University Court, or in such medical schools or under such teachers as may be recognised for the purpose by the University Court. Women are admitted to graduation in Medicine, subject to certain provisions.

Professional Examinations for the Degrees of Bachelor of Medicine and Bachelor of Surgery.—Each candidate will be examined both in writing and orally, and also clinically where the nature of the subject admits, in the following divisions—viz., first, in Botany, Zoology, Physics, and Chemistry; second, in Anatomy and Physiology; third, in Materia Medica, Pathology and Bacteriology, Forensic Medicine and Public Health; and fourth, in Surgery, Clinical and Operative Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and Gynæcology (Systematic and Clinical).

UNIVERSITY COLLEGE, DUNDEE.—The Medical School in St. Andrews University is carried on as follows: In the case of St. Andrews tuition is given only for the first two years, up to and including Physiology and Anatomy. There are no facilities in St. Andrews for clinical studies, but a complete course is given in Dundee from the beginning to the end of the curriculum. Thus it is possible for a student to take his first two years of the curriculum in St. Andrews, transfer to Dundee and complete his course there, or take all his course in Dundee. In either case, the entire curriculum is still in the University. As regards "conjoint medical school," this term seems to refer to the point that in the United College, Dundee, which originally was not an integral part of the University, there was provision made for teaching the first two years of the medical curriculum. Subsequently, Dundee College was affiliated and these original Dundee chairs were included, but the administration of the funds is still retained by the Governors of the United College, Dundee. The remaining chairs in Dundee are financed by the University of St. Andrews. Both the Dundee professors and the St. Andrews professors in Dundee teach in a common building.

ROYAL INFIRMARY, Dundee (461 beds).—In addition to the ordinary Medical and Surgical Wards, there are special departments for Midwifery (In- and Out-door), for Diseases of Women, of Children, of the Eye, of the Ear, Nose, and Throat, and of the Skin; and for Clinical Pathology, Radiology, Electrotherapeusis, and Electrocardiography. An extension providing for a new X Ray Department and Massage Department and for additional Operation Theatre accommodation has been opened recently, a new Maternity Department is being built at a cost of £32,000, and a new Dispensary at a cost of £25,000. Clinical teaching is given to male and female students by the Honorary Staff; post-mortem examinations are conducted by [illegible] courses of instruction are [illegible] versity of St. Andrews and t[illegible] and Boards of the United Kingdom. Ten Resident Medical Officers are appointed every six months. Clinical clerks and dressers are attached to the Physicians and Surgeons; and Students are appointed as assistants in the pathological department. Further information may be obtained from the Medical Superintendent.

UNIVERSITY OF ABERDEEN.

The University of Aberdeen grants four degrees in Medicine and Surgery—viz., *M.D.*, *Ch.M.*, *M.B.*, and *Ch.B.* The Degree of Doctor of Philosophy (*Ph.D.*) is also granted in the Faculty of Medicine.

Degrees of M.B. and Ch.B.—Candidates, before entering on the curriculum, must have passed the Preliminary Examination or hold a qualification recognised as exempting from such examination, have attained the age of 17, and have passed the Pre-registration Examination in Physics and Chemistry.

The curriculum for the degrees extends over a period of five years, during which attendance is required in the following subjects: Botany, Zoology, Physics, Chemistry (Systematic and Practical), Anatomy (Systematic and Practical), Physiology (Systematic and Practical), Materia Medica and Therapeutics, Practical Pharmacy, Pathology (Systematic and Practical), Medical Jurisprudence, Public Health, Surgery, Medicine, and Midwifery.

Candidates must attend for at least three years the medical and surgical practice of a recognised hospital; they must have attended courses of at least nine months in clinical medicine and clinical surgery, and have acted as clerk in the medical and dresser in the surgical wards of a hospital. Attendance is required on the practice of a dispensary or the out-practice of a hospital and also on courses in Mental Diseases, Fevers, Ophthalmology, Post-mortem Examinations, Venereal Diseases, Tuberculosis, Radiology, X Ray, Therapeutics and Electrical Treatment, and Clinical Chemistry, and other special subjects. The candidate is also required to have been properly instructed in Vaccination and to have attended at least 20 Midwifery cases.

Degrees of M.D. and Ch.M.—Candidates for either of these degrees must already hold the degrees of M.B. and Ch.B. of Aberdeen. A thesis (in duplicate) has to be presented and an examination has to be passed in Clinical Medicine (or in some special Department of Medical Science) or Clinical Surgery, as the case may be.

Degree of Ph.D.—For this degree candidates must pursue a course of special study or research during a period of nine academical terms as Research Students in the University of Aberdeen or in any College or Institution that may be affiliated thereto. A Thesis (in duplicate) must be presented for approval.

A diploma in Public Health is granted by the University to graduates in Medicine of a University in the United Kingdom, after a special examination.

Scholarships and Prizes.—In the Faculty of Medicine of the University of Aberdeen there are the following Bursaries, Scholarships, and Prizes:—Bursaries: about 15 Bursaries (competition and presentation) are open each year, of £15 to £30 per annum in value, most of them being tenable for three years. Scholarships: five Post-graduate Scholarships, value £36 to £160 per annum. Prizes and Medals: 15 Gold Medals and Prizes for proficiency in special departments.

ABERDEEN ROYAL INFIRMARY (366 beds).—The main clinical work of the students is done in the Infirmary with its general and special facilities, including a Department of Clinical Chemistry.

ABERDEEN ROYAL MENTAL HOSPITAL.—This hospital contains, with hospital attached to main institution and agricultural branch, about 950 beds. Clinical instruction is given to students during three *months in summer. Physician-Superintendent*, Dr. R. Dods Brown.

OTHER HOSPITALS.—Students have the opportunity *of attending the following institutions: City* Fever Hospital, Sick Children's Hospital, General Dispensary, Lying-in and Vaccine Institutions, and Ophthalmic Institution.

SCOTTISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

These Colleges have made arrangements by which, after one series of examinations, held in Edinburgh or Glasgow, or both, the student may obtain the diplomas of the three bodies. This is the Scottish Conjoint Board.

The three bodies grant their Single Licences only to candidates who already possess legal qualifications in Medicine or Surgery.

The hospitals which are recognised by the Scottish Conjoint Board as places where professional study for their diplomas can be pursued are all those institutions which feed the medical faculties of the universities, as well as all the places which are recognised by the English and Irish Conjoint Boards.

Professional Education.—The candidate must produce certificates or other satisfactory evidence of having attended the following separate and distinct courses of instruction: Physics, three months; Elementary Biology, three months; Chemistry, six months; Practical or Analytical Chemistry, three months; Anatomy, during at least six months; Practical Anatomy, twelve months; Physiology, six months; Practical Physiology, three months; Materia Medica, three months; Pathology (including Practical Pathology), nine months; Practice of Medicine, six months; Clinical Medicine, nine months; Principles and Practice of Surgery, six months; Clinical Surgery, nine months; Midwifery, three months; Gynæcology, one course of not less than 13 meetings; Diseases of Children, one course of not less than 13 meetings; Medical Jurisprudence and Public Health, three months. The certified attendance on lectures, demonstrations, and practical work must not be less than three-fourths of the total number of roll-calls. Every student undergoes a course of Practical Midwifery, but before attending at labours he is required to attend a course of lectures on Surgery and Midwifery and to hold the offices of Clinical Medical Clerk and Surgical Dresser. He must also attend for two and a half months' instruction in Practical Pharmacy; the certificate to be signed by the teacher, who must be a member of the Pharmaceutical Society of Great Britain, or the superintendent of the laboratory of a public hospital or dispensary, or a registered practitioner who dispenses medicines to his patients, or a teacher of Practical Pharmacy.

The student must attend for 27 months the Medical and Surgical practice of a public general hospital containing on an average at least 80 patients available for clinical instruction, and possessing distinct staffs of physicians and of surgeons. He must act as Surgical Dresser and Medical Clinical Clerk for not less than six months in the wards in each case, and receive practical instruction in administration of anæsthetics. He must attend for six months the practice of a public dispensary especially recognised by any of the above authorities, or the out-patient practice of a recognised general hospital. This attendance should be made after the student has passed the First and Second examinations.

Candidates are also required to attend the following courses: Diseases and Injuries of the Eye, three months; Insanity, three months; Infectious Diseases, three months; Gynæcology, three months; Diseases of Children, three months.

The curriculum lasts for five years, the fifth year being devoted to clinical work.

There are four professional examinations:—

First Examination includes Physics, Chemistry, and Elementary Biology.

Second Examination includes Anatomy and Physiology and Histology; and candidates may be admitted to this examination at the end of the second year of medical study.

Third Examination includes Pathology and Materia Medica with Pharmacology.

Final Examination.—The Final Examination shall not be taken earlier than the end of the fifth year of study and shall embrace the following subjects:—Medicine, including Therapeutics, Medical Anatomy, and Clinical Medicine; Surgery, including Surgical Anatomy, Clinical Surgery, and Diseases and Injuries of the Eye; Midwifery and Diseases of Women; and, if not passed previously, Medical Jurisprudence and Public Health; but it is optional to candidates who have passed the Third Examination to be admitted to the subject of Medical Jurisprudence and Public Health on lodging certificates of having attended the necessary course *in that* subject at any time; but the subjects of Medicine, Surgery, and Midwifery shall be taken together at any time after the end of the fifth Winter Session, provided that a period of [illegible] *months has elapsed* since passing the Second Examination. All candidates shall be subjected, in addition to the written and oral examinations, to clinical examinations in Medicine and Surgery, which shall include the Examination of Patients, Physical Diagnosis, the Clinical Use of the Microscope, Examination of the Urine and Urinary Deposits, Surgical Appliances, Bandages, and Surface Marking.

There are four periods of examination annually.

The Registrar in Edinburgh is Mr. D. L. Eadie, 49, Lauriston-place; and the Registrar in Glasgow, Mr. Walter Hurst, 252, St. Vincent-street, to whom fees and *certificates* must be sent for the respective examinations, and from whom particulars of fees can be obtained.

For students registered with the General Medical Council after Jan. 1st, [illegible], more extensive Regulations are in force, and candidates applying for Regulations should state date of registration.

SCHOOL OF MEDICINE OF THE ROYAL COLLEGES, Edinburgh.—The number of students varies much in the classes and subjects. It is within the limit to say that about [illegible] students avail themselves each session of the opportunity of attending the school. The lectures qualify for the University of Edinburgh and other Universities, the Royal Colleges of Physicians and Surgeons of London, Edinburgh, and Dublin, the Faculty of Physicians and Surgeons of Glasgow, and other Medical and Surgical and Public Boards. Special courses of instruction for dental students are also included in the curriculum of this school. The practical classes and laboratories will open and the lectures commence on Oct. 2nd. In accordance with the statutes of the University of Edinburgh one-half of the qualifying classes required for graduation may be attended in this school. The regulations require that the fee for any class taken for graduation in Edinburgh shall be the same as that for the corresponding class in the University. The whole education required for graduation at the University of London may be taken in this school. Post-graduate Courses are conducted in conjunction with the University. Further particulars regarding the school, also its calendar (price 6*d.*) may be had on application to the Dean of the School, Edinburgh.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

In addition to the diplomas granted by the Scottish Conjoint Board the Royal College of Physicians grants its Single Licence to candidates already possessing legal qualifications for professional practice.

The Royal College of Physicians of Edinburgh grants a *Membership* and a *Fellowship.*

Membership.—A candidate, who must be a Licentiate of a British or Irish College of Physicians, or a graduate in medicine of a University, approved by the Council, and 24 years of age, is examined in medicine, therapeutics, and in any branch of the departments of medicine specially professed, such as general pathology, psychology, public health obstetrics, gynæcology, diseases of children, tropical medicine, or medical jurisprudence.

Fellowship.—The Fellows are selected from the ranks of the *Members.*

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

The Royal College of Surgeons of Edinburgh admits to the examination for its Single Licence any candidates who hold a Diploma in Medicine of any British, Indian, or Foreign university or of any British College of Physicians, or of the Society of Apothecaries of London or Apothecaries' Hall, Dublin, granted under the provisions of the Medical Act, 1886, whose preliminary examination and course of professional study is proved to be sufficient to fulfil the requirements of the College, or to those who have passed a full examination for any of the above. Female practitioners are admitted to the Licence of the College and also to the Fellowship, and the regulations apply to practitioners of either sex.

The College grants a diploma of Fellowship after examination to the holders of British surgical degrees or diplomas and the holders of recognised degrees of the Universities of Canada, Australia, New Zealand, and the Indian Empire.

The Fellowship.—Candidates must be 25 years of age and in practice for at least two years. The examination is written and viva voce, and includes surgery and surgical anatomy, operative surgery, and clinical practice. One optional subject must also be taken, the range of these specialisms covering nearly every branch of medicine. Candidates are not allowed to appear for more than three times at the examinations. One month's notice of intention to appear for examination must be given by the candidate to the College.

THE ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

The Royal Faculty of Physicians and Surgeons of Glasgow grants a Fellowship and a Licence to be held separately. The Licence is granted as a separate qualification to qualified practitioners in Medicine after examination in surgery, including surgical anatomy and clinical surgery.

Fellowship.—The Fellowship of the Faculty is granted after examination in medicine or surgery, together with an optional subject, which may be anatomy or physiology or be selected from any special branch of medicine or surgery. Fourteen days' notice must be given by the candidate to the Faculty. In certain circumstances Fellows may be elected as a mark of distinction.

III.—IRELAND.

THE UNIVERSITIES.

UNIVERSITY OF DUBLIN, TRINITY COLLEGE (SCHOOL OF PHYSIC).

Matriculation.—University students take the Entrance of Trinity College and a Junior Freshman Term or a special Medical Preliminary; Extern Students, any examination recognised by the General Medical Council.

Pre-registration Examination in Elementary Physics and Chemistry.—Before beginning the five years' Medical curriculum students must pass an examination in elementary Physics and Chemistry. This examination is held at the end of September, in January, in March, and in June. Courses in preparation for it may be taken in the School of Physic.

Degrees in Medicine (M.B.), Surgery (B.Ch.), and Midwifery (B.A.O.).—Candidates for these degrees must be of B.A. standing and must be for at least five academic years on the books of the Medical School, reckoned from the date of registration. The Arts course may be taken concurrently with the Medical course, and the B.A. degree need not be taken before the final medical examinations, but the Medical degrees are not conferred without the Arts degree. The following courses must be attended:—(1) Lectures—Botany, Zoology, Physics and Practical Physics; Systematic, Descriptive and Applied Anatomy; Chemistry and Practical Chemistry; Histology, Physiology, Practical and Applied Physiology; Practice of Medicine; Midwifery and Gynæcology, Pathology and Bacteriology; Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Surgery and Operative Surgery; (2) three courses of nine months' attendance on the Clinical Lectures of Sir Patrick Dun's or other recognised Hospital; (3) Practical Vaccination, one month's instruction; (4) Mental Disease, three months; (5) Practical Midwifery with Clinical Lectures, including not less than 20 personally conducted cases, six months; (6) Ophthalmic Surgery, three months. Three groups of examinations have to be passed. Preliminary Scientific Examination, including Physics and Chemistry, Botany, and Zoology. The Intermediate Medical, Part I., including Anatomy, Physiology, and Organic Chemistry; and Part II., including Applied Anatomy and Applied Physiology; and the Final Examination, which is divided into Part I., Materia Medica and Therapeutics. Hygiene and Jurisprudence, Pathology and Bacteriology; and Part II., Medicine, including Clinical Medicine and Mental Diseases; Surgery, including Operative and Ophthalmic Surgery; Midwifery and Gynæcology. Part I. may be passed in the fourth year, and Part II. completed at the end of the fifth.

Doctor in Medicine.—A Doctor in Medicine must have passed all the qualifying examinations and must be a B.A. of three years' standing. He must also submit a thesis and pass an Examination before the Regius Professor of Physic.

Master in Surgery.—A Master in Surgery must be a Bachelor in Surgery of the University of Dublin of not less than three years' standing, and must produce satisfactory evidence of having been engaged for not less than two years from the date of his registration in the study, or study and practice, of his profession. He must then pass a special examination.

Master in Obstetric Science.—A Master in Obstetric Science must be a Bachelor in Obstetric Science of two years' standing, and must produce evidence of having been engaged in the study of Obstetric Medicine and Surgery during two years. He is then required to pass a special examination.

Diploma in Gynæcology and Obstetrics.—A post-graduate diploma is conferred upon registered medical practitioners who take a six months' course at the Rotunda Hospital or other recognised institution, a six months' course in Trinity College, and then pass a special examination. The minimum time required for the complete course is nine months.

Bachelor in Dental Science and Master in Dental Science.—The regulations under which these degrees are awarded can be obtained by application to the Registrar of the School of Physic.

All Degrees and Courses of Instruction are open to women students.

Scholarships and Prizes.—1. Medical and Surgical Travelling Prizes, £100, awarded in alternate years. 2. Bicentenary Memorial Prize, £30, awarded yearly, and given to the Travelling Prize man. 3. Sir John Banks Prize and Medal. 4. Edward Hallaran Bennett Prize and Medal. 5. FitzPatrick Scholarship, awarded on results of Final Examination (interest on £1000). 6. Medical Scholarship, £20 per annum for two years, awarded in Chemistry, Physics, Botany, and Zoology. 7. Medical Scholarship in Anatomy and Physiology, £20 per annum for two years. 8. Henry Hutchinson Stewart Scholarships, one in Botany, Zoology, Chemistry and Physics, and another in Anatomy and Physiology, awarded annually and valued at £10 per annum for three years. 9. Henry Hutchinson Stewart Scholarship in Mental Diseases, awarded from time to time, £50 per annum for three years. 10. John Mallet Purser Medal, awarded annually in Physiology. 11. Daniel John Cunningham Medal and Prize, awarded annually in Anatomy. 12. Begley Studentship, £40 per annum for four years, awarded annually. 13. Kingsmill Jones Memorial Prize, awarded annually in Natural and Experimental Science, £15. 14. O'Sullivan Memorial Scholarship, £48 awarded annually for excellency of record in school.

Post-graduate Instruction.—Arrangements have been made, with the approval of the Board of Trinity College, for a post-graduate course of instruction at the School of Physic during the autumn from Monday, Sept. 17th, to Saturday, Oct. 6th. Members of the class can reside in college rooms and dine on commons.

HOSPITALS AFFORDING PRACTICE RECOGNISED BY THE IRISH UNIVERSITIES AND CORPORATIONS.[1]

SIR PATRICK DUN'S HOSPITAL, Grand Canal-street, Dublin.—Classes both in Medicine and Surgery are held each morning from 9 o'clock from Oct. 1st till the end of June. Special classes for junior students will be held in the wards during the months of October, November, and December. A Resident Surgeon, with salary, is appointed annually. Six Resident Pupils are appointed every six months. Twelve surgical Dressers and twelve Clinical Clerks are appointed each month. There are facilities for women students.

The practice of the hospital is open to all students, and the certificates are recognised by Dublin University, the National University and Royal Colleges of Surgeons of England, Ireland, and Scotland. It is an official "Treatment Centre" for venereal diseases.

Prizes and Medals.—Clinical medals and prizes amounting to about £21 each will be awarded in Medicine and in Surgery respectively in accordance with the will of the late Rev. Samuel Haughton, M.D., S.F.T.C.D. Candidates who fail to obtain these medals and prizes will be awarded special certificates in Medicine and in Surgery provided they show sufficient merit.

Further information will be supplied by the Hon. Secretary to the Medical Board.

ADELAIDE HOSPITAL, Peter-street, Dublin.—Two resident surgeons are elected half-yearly and four or more resident pupils every six months. At the termination of the session prizes in Clinical Medicine, in Surgery, in Gynæcology, and in Dermatology will be awarded.

Prizes.—Wallace Beatty Memorial bursaries are awarded at the commencement of the winter session. In addition to the junior prizes the Hudson Scholarship, £30 and a gold medal, as well as a prize of £10 together with a silver medal, are awarded at the end of the session for proficiency in medicine, surgery, gynæcology, and pathology.

The certificates of attendance are recognised by all the Universities and licensing bodies in the United Kingdom. Further particulars may be obtained from the Secretary of the Hospital.

MATER MISERICORDIÆ HOSPITAL, Dublin. (Under the care of the Sisters of Mercy.)—This Hospital, containing 382 beds, is open at all hours for the reception of accidents and urgent cases. Clinical instruction is given by the Physicians and Surgeons at 9 A.M. daily. Ophthalmic Surgery is taught in the Special Wards and in the Dispensary. Surgical operations are performed daily. Connected with the hospital are extensive Dispensaries, which afford valuable opportunities for the study of general Medical and Surgical Diseases, and Accidents; a fully-equipped Biochemical Laboratory, a modern Electro-Massage Department, and Electrocardiograph room. Instruction is given on Pathology and Bacteriology. Three House Physicians, eight House Surgeons, and 18 resident pupils are elected annually. Dressers and Clinical Clerks are appointed regularly and certificates given for merit. Leonard Prizes will be offered for competition annually. Certificates of attendance are recognised by all the Universities and licensing bodies in the United Kingdom. There is a Private Hospital for the reception of Medical and Surgical cases. A Training School and a Home for Trained Nurses are connected with the Hospital, and Nurses who have passed a qualifying examination can be obtained on application to the Lady Superior.

Entries can be made with any of the physicians or surgeons, or with the Registrar, 13, Merrion-square. Detailed information may be obtained from the Secretary, Medical Board.

MERCER'S HOSPITAL.—This hospital contains 120 beds for medical and surgical cases, and arrangements have been made with the medical officers of Cork-street Fever Hospital whereby all students of this hospital are entitled to attend the clinical instruction of that institution and become eligible for the resident posts. There is a large dispensary for out-patients and a modern X ray department. An electrocardiograph has been installed. Students of the hospital are permitted to attend the gynæcological department, where they receive practical instruction. There are special wards for the treatment and study of children's diseases. A gold medal is awarded annually to the best student. During the past few years the hospital has undergone extensive alterations in order to bring it up to modern requirements. A House Surgeon is appointed annually. There are six men and two women Resident Pupils, and Clinical Clerks and Dressers are appointed from members of the classes.

For further particulars apply to Dr. Leonard Abrahamson, Hon. Sec., Medical Board, 40, Fitzwilliam-place.

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[1] This list of the institutions recognised by the Conjoint Board of Ireland is supplemented in the regulations of the Colleges by those hospitals mentioned as recognised institutions in Scotland and England. The recognised facilities for clinical instruction in some of the Irish centres have been described.

Richmond, Whitworth, and Hardwicke Hospitals (House of Industry Hospitals), Dublin.—These hospitals contain 330 beds—130 for Surgical cases, 80 for Medical cases, 78 for Fever and other Epidemic Diseases, and an Auxiliary Wing of 42 beds. A Resident Physician and a Resident Surgeon are appointed each half year and are paid for their services. Resident Clinical Clerks are appointed each quarter and provided with furnished apartments and fuel. These appointments are open not only to advanced students but also to those who are qualified in Medicine and Surgery. The Dressers are selected from among the best qualified of the pupils without the payment of any additional fee. Women students are eligible for election as residents, and special apartments are reserved for their use. Extensive alterations and improvements have recently been made in the X ray, electrotherapeutic, and electrocardiographic departments. For information apply to Dr. G. E. Nesbitt, 71, St. Stephen's Green, Dublin.

Royal City of Dublin Hospital.—158 beds and a special wing for the treatment of fevers and contagious diseases founded by the late Mr. Drummond. There is a large nursery where special opportunities are afforded for the study of diseases of children, both medical and surgical. There are also special wards for ophthalmic, aural, and gynæcological cases. There is a largely attended out-patient department, where students are allowed to attend accidents and dress cases under supervision. Six resident pupils are appointed every three months. A House Surgeon and a House Physician are appointed annually. For information apply to the Secretary.

Dr. Steevens' Hospital, Dublin (Kingsbridge).—250 beds, only 150 now in use. There is accommodation for 10 resident pupils, each of whom is provided with a separate bedroom, and board is supplied by the hospital at a reasonable rate. There is an Electric Massage Department, a " Sun-Ray " Department, and an X Ray Department. There are also two V.D. wards and a largely attended V.D. Treatment Centre. All information with regard to the terms for such residency can be had from the Resident Surgeon at the Hospital. Secretary: E. D. F. Banks.

Meath Hospital and County Dublin Infirmary.* 150 beds are available for clinical teaching. A building containing 40 of these beds intended for the isolated treatment of fevers is attached to the hospital. The certificates of this hospital are recognised by all the universities and licensing bodies of the United Kingdom. Medical Clinical Clerks and Surgical Resident Pupils and Dressers are appointed every three months. Two House Surgeons and a Resident Casualty Officer are elected twice annually. The Smyth Memorial Prize in Medicine, value £50, is awarded in alternate years and is open to students of the hospital who have attended for at least two academic years. The next examination will be held in June, 1929. The Treasurer of the Medical Board will give full information.

Jervis-street Hospital, Dublin.*—Founded 1718; rebuilt 1886. 130 beds. The operation theatre contains all modern requirements.

Rotunda Hospital, Dublin.—This institution is the largest combined gynæcological and maternity hospital in the British Empire. Over 4000 confinements are attended annually and upwards of 1000 gynæcological patients admitted. Students can take out their necessary gynæcological and midwifery practical courses. The work of the hospital is carried on continuously through the year, and consists of daily clinical instruction in the maternity department and examination and operations in the gynæcological department. Qualified students are given facilities for studying and assisting in the management of all abnormal cases so far as is practical. An antenatal dispensary is held three times weekly and all students are encouraged to attend. A special class in gynæcological examination and diagnosis is conducted by the Assistants to the Master. In addition there is a special class in operative obstetrics, limited in number. The pathological laboratory is under the supervision of a skilled pathologist, who gives special classes at intervals. There is a fully equipped X ray installation under the care of a competent radiologist. A ward has been opened for the treatment of infantile conditions, and is under the care of a pediatrician, who gives instruction in the out-patient department, which is held daily. The appointments on the staff of the hospital are given to qualified past students of the hospital who have taken the L.M. and consist of Extern Assistants for six months, one being appointed every three months. From these the Assistants to the Master are appointed. Women students can reside in the hospital on the same terms as men. The mess room and sleeping quarters have been decorated recently and reading rooms are provided. The L.M. is granted by examination after a six months' course. Fees for Intern students: one month £6 6*s.*, months other than the first £4 4*s.*, three months £12 12*s.*, six months £21. Special gynæcological class £2 2*s.* per month. For further particulars apply to the Master, Dr. Bethel Solomons, F.R.C.P.I.

Coombe Lying-in Hospital and Guinness Dispensary for the Treatment of Diseases Peculiar to Women, Dublin.—This hospital contains 70 beds and consists of two divisions, one of which is devoted to lying-in cases and the other to the treatment of diseases peculiar to women. Lectures are delivered, practical instruction given, and gynæcological operations are performed in the theatres daily. There is a general dispensary held daily, at which instruction is given on the Diseases of Women and Children. There is a special afternoon dispensary held by the Master and his assistants, at which practical instruction in gynæcology is given. There is no extra charge for attendance at this Dispensary. There is accommodation for intern pupils, who enjoy exceptional advantages of acquiring a thorough knowledge of this branch of their profession. Women students can reside in the hospital. Clinical assistants are appointed from amongst the pupils as vacancies occur. Certificates of attendance at this hospital are accepted by all licensing bodies. Students can enter for attendance at any time, but preference is given to those entering from the first day of the month. Further particulars may be had on application to the Master or the Registrar at the Hospital.

National Maternity Hospital, Holles-street, Dublin.—Established 1894. The hospital consists of Intern and Extern Maternity, Gynæcological Wards, and a Dispensary for the treatment of Diseases of Women and Children and an antenatal and postnatal branch. Every facility is given for the carrying out of practical work. Undergraduate and postgraduate courses are arranged at any time. Certificates of attendance at this hospital are recognised by all the licensing bodies. Clinical lectures are given daily and Oral lectures four times per week. The L.M. Diploma is given by special examination, which is held three times a year. Further particulars can be obtained from the Master or from the Secretary, Holles-street, Dublin.

St. Vincent's Hospital and Dispensary, Dublin.—Established 1834. 200 beds. Clinical Lectures in Medicine and Surgery are held from October to June. Special classes for Juniors from October to December. Pathological and Bacteriological Demonstrations are given every Thursday, and instructions in the use of Laryngoscope and Otoscope for senior students every Saturday. Medals and Prizes: the Bellingham gold medal in Medicine and the O'Farrell gold medal in Surgery are offered for competition at the end of the summer session, as well as junior prizes, also the

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* No returns.

McArdle Memorial Prize, value £20. There are a large Extern Department and a new Pathological Laboratory. Hon. Secretary Medical Board, Wm. Doolin, M.B., F.R.C.S., 2, Fitzwilliam-square, Dublin.

NATIONAL UNIVERSITY OF IRELAND.*

Matriculation.—All students must pass a matriculation examination; the examination taking place in June and September in Dublin, and at certain local centres, includes five subjects, three of which must be Irish, English, and mathematics. All students must pass in Irish except students not born in Ireland, and other students whose home residence shall have been outside Ireland during the three years immediately preceding their matriculation; but all such students will be expected to attend a course of instruction in Irish Literature and History prior to obtaining any degree in the University. The following are the subjects for examination:—1. Irish. 2. Latin or Greek. 3. French, German, Italian, Spanish, Portuguese, Welsh, or any other modern language approved by the Senate. 4. English 5. Mathematics. 6. Latin, Greek, French, German, Welsh, Spanish, Italian, Portuguese, or any other modern language approved by the Senate, History, Geography, Applied Mathematics, or Physics as an alternative, Chemistry, Botany, Agricultural Science, Commerce, Music, and for women candidates only Physiology and Hygiene. Students entering for degrees in Medicine or Dentistry, if already registered by the General Medical Council, must take Irish, Latin, English, Mathematics, and a fifth subject.

The medical degrees granted are:—

M.B., B.Ch., and B.A.O.; and M.D., M.Ch., and M.A.O., Ph.D.—Printed forms of application for admission to any medical examination may be had from "The Registrar, The National University of Ireland, Dublin."

The Constituent Colleges of the National University of Ireland at which the full curriculum for medical degrees can be obtained are University College, Dublin; University College, Cork; and University College, Galway.

UNIVERSITY COLLEGE, DUBLIN.—*Matriculation.*—Almost all the students of the College are matriculated students of the National University of Ireland. The pre-registration examination in physics and chemistry is taken after matriculation either at the beginning of or during the winter session. The course is of five years' duration and dates from the passing of the pre-registration examination.

Degrees of M.B., B.Ch., and B.A.O.—The First Examination includes Applied Physics, Applied Chemistry, Botany, Zoology, and Applied Biology. The examination may be taken in two parts: Part I., Physics and Chemistry; Part II., Botany and Zoology. Honours may be obtained only when both parts are taken as one examination. The Second Examination includes Anatomy and Physiology. Both must be passed at the same time. The Third Examination (Part I.) includes Pathology, Materia Medica, Pharmacology, and Therapeutics. Part II. (Third Examination), taken at the end of the Fourth Winter Session, includes Hygiene and Medical Jurisprudence.

The Final Examination in Medicine, Midwifery, Surgery, and Ophthalmology includes both the theoretical and the clinical branches. No student can enter for the M.B., B.Ch., or B.A.O. until the end of the fifth year after registration, when the curriculum has been completed. The degree of M.D. may be obtained either by examination or on published work.

A Post-graduate Summer Course is held each year, beginning about the middle of June. The D.P.H. Course extends over the year, beginning at the opening of the session.

UNIVERSITY COLLEGE, CORK: THE SCHOOL OF MEDICINE.—Students must have passed the Matriculation Examination of the University or some other recognised examination, and a preliminary examination recognised by the General Medical Council.

Medical Students who have passed the First Professional Examination of the Conjoint Boards of Ireland, England, or Scotland may be admitted to the rank of second-year students on making application to the Council. Similarly, students who have passed the Second Professional Examination of the same Boards may be admitted to the rank of third-year students; and those who have passed the Third Professional Examination of the Dublin Colleges, or of the Edinburgh Colleges and Glasgow Faculties, may rank as fourth-year.

The school is provided with physiological, toxicological, pathological, and pharmaceutical laboratories, materia medica, anatomical and pathological museums, as well as a collection of surgical and obstetrical instruments and appliances. There are dissecting-rooms, well-appointed physical, chemical, and biological laboratories, a large natural history museum in the adjoining building, and part of the College ground is laid out as a botanical garden. The plant houses are well filled with plants and are open to the students in the class of Botany. The Library contains about 70,000 volumes and is open daily during term time to students. The Medical Museum occupies a large room erected at the northern end of the medical buildings. There are Students' Clubs for men and women students of the College and various athletic clubs.

Residence of Students.—Students not living at home, or with relatives or friends, sanctioned by their parents or guardians, are required to live in a hostel or in recognised lodgings, and register their addresses each session. The Honan Hostel, adjoining the College, is equipped by private endowment. A number of sets of rooms, together with recreation and common rooms, are provided for lay students who may desire to live there. For full particulars apply to the Warden. The Ursuline Convent, Blackrock, has a house of residence, quite separate from their Secondary School, for Catholic women students.

Clinical Instruction.—Students may attend the South Charitable Infirmary and County of Cork General Hospital, Cork North Charitable Infirmary and City of Cork General Hospital, the Mercy Hospital, the Cork District Lunatic Asylum, the Victoria Hospital for Diseases of Women and Children, the County Lying-in Hospital, Bon Secours, Fever, the District, and Ear, Eye, and Throat Hospitals.

Complete information with regard to class fees, scholarships, and prizes can be obtained from the Dean of the Medical Faculty, and in respect of the hospitals from the Secretaries.

UNIVERSITY COLLEGE, GALWAY: SCHOOL OF MEDICINE.—The College contains a well-lighted and ventilated dissecting-room and an anatomical lecture theatre; physiological, pathological, pharmaceutical, chemical, and physical laboratories; anatomical, pathological, gynæcological, and materia medica museums; as well as large natural history and geological museums and an extensive library in which students can read and from which they can borrow books. There are 12 Entrance Scholarships, value £25 each, for which Medical Students compete with other students on the Entrance Course. In the Second, Third, and Fourth years three Scholarships in each year, value £25 each, are reserved for Medical Students. H. H. Stewart Scholarships (£10 a year for three years) are awarded by the University in Anatomy and Physiology at Second Medical Examination amongst Students of the three constituent Colleges. Travelling Studentships (£200 a year for two years) are offered by the University for competition amongst Medical Graduates of the three Colleges of not more than two years' standing. Women students are eligible for all College and University Degrees, Distinctions, and Prizes. There are extensive grounds, a portion of which

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* No returns.

RICHMOND, WHITWORTH, AND HARDWICKE HOSPITALS (HOUSE OF INDUSTRY HOSPITALS), Dublin.—These hospitals contain 330 beds—130 for Surgical cases, 80 for Medical cases, 78 for Fever and other Epidemic Diseases, and an Auxiliary Wing of 42 beds. A Resident Physician and a Resident Surgeon are appointed each half year and are paid for their services. Resident Clinical Clerks are appointed each quarter and provided with furnished apartments and fuel. These appointments are open not only to advanced students but also to those who are qualified in Medicine and Surgery. The Dressers are selected from among the best qualified of the pupils without the payment of any additional fee. Women students are eligible for election as residents, and special apartments are reserved for their use. Extensive alterations and improvements have recently been made in the X ray, electrotherapeutic, and electrocardiographic departments. For information apply to Dr. G. E. Nesbitt, 71, St. Stephen's Green, Dublin.

ROYAL CITY OF DUBLIN HOSPITAL.—158 beds and a special wing for the treatment of fevers and contagious diseases founded by the late Mr. Drummond. There is a large nursery where special opportunities are afforded for the study of diseases of children, both medical and surgical. There are also special wards for ophthalmic, aural, and gynæcological cases. There is a largely attended out-patient department, where students are allowed to attend accidents and dress cases under supervision. Six resident pupils are appointed every three months. A House Surgeon and a House Physician are appointed annually. For information apply to the Secretary.

DR. STEEVENS' HOSPITAL, Dublin (Kingsbridge).—250 beds, only 150 now in use. There is accommodation for 10 resident pupils, each of whom is provided with a separate bedroom, and board is supplied by the hospital at a reasonable rate. There is an Electric Massage Department, a " Sun-Ray " Department, and an X Ray Department. There are also two V.D. wards and a largely attended V.D. Treatment Centre. All information with regard to the terms for such residency can be had from the Resident Surgeon at the Hospital. Secretary: E. D. F. Banks.

MEATH HOSPITAL AND COUNTY DUBLIN INFIRMARY.* 150 beds are available for clinical teaching. A building containing 40 of these beds intended for the isolated treatment of fevers is attached to the hospital. The certificates of this hospital are recognised by all the universities and licensing bodies of the United Kingdom. Medical Clinical Clerks and Surgical Resident Pupils and Dressers are appointed every three months. Two House Surgeons and a Resident Casualty Officer are elected twice annually. The Smyth Memorial Prize in Medicine, value £50, is awarded in alternate years and is open to students of the hospital who have attended for at least two academic years. The next examination will be held in June, 1929. The Treasurer of the Medical Board will give full information.

JERVIS-STREET HOSPITAL, Dublin.*—Founded 1718; rebuilt 1886. 130 beds. The operation theatre contains all modern requirements.

ROTUNDA HOSPITAL, Dublin.—This institution is the largest combined gynæcological and maternity hospital in the British Empire. Over 4000 confinements are attended annually and upwards of 1000 gynæcological patients admitted. Students can take out their necessary gynæcological and midwifery practical courses. The work of the hospital is carried on continuously through the year, and consists of daily clinical instruction in the maternity department and examination and operations in the gynæcological department. Qualified students are given facilities for studying and assisting in the management of all abnormal cases so far as is practical. An *antenatal* dispensary is held three times weekly and all students are encouraged to attend. A special class in gynæcological examination and diagnosis is conducted by the Assistants to the Master. In addition there is a special class in operative obstetrics, limited in number. The pathological laboratory is under the supervision of a skilled pathologist, who gives special classes at intervals. There is a fully equipped X ray installation under the care of a competent radiologist. A ward has been opened for the treatment of infantile conditions, and is under the care of a pediatrician, who gives instruction in the out-patient department, which is held daily. The appointments on the staff of the hospital are given to qualified past students of the hospital who have taken the L.M. and consist of Extern Assistants for six months, one being appointed every three months. From these the Assistants to the Master are appointed. Women students can reside in the hospital on the same terms as men. The mess room and sleeping quarters have been decorated recently and reading rooms are provided. The L.M. is granted by examination after a six months' course. Fees for Intern students: one month £6 6*s*., months other than the first £4 4*s*., three months £12 12*s*., six months £21. Special gynæcological class £2 2*s*. per month. For further particulars apply to the Master, Dr. Bethel Solomons, F.R.C.P.I.

COOMBE LYING-IN HOSPITAL AND GUINNESS DISPENSARY FOR THE TREATMENT OF DISEASES PECULIAR TO WOMEN, Dublin.—This hospital contains 70 beds and consists of two divisions, one of which is devoted to lying-in cases and the other to the treatment of diseases peculiar to women. Lectures are delivered, practical instruction given, and gynæcological operations are performed in the theatres daily. There is a general dispensary held daily, at which instruction is given on the Diseases of Women and Children. There is a special afternoon dispensary held by the Master and his assistants, at which practical instruction in gynæcology is given. There is no extra charge for attendance at this Dispensary. There is accommodation for intern pupils, who enjoy exceptional advantages of acquiring a thorough knowledge of this branch of their profession. Women students can reside in the hospital. Clinical assistants are appointed from amongst the pupils as vacancies occur. Certificates of attendance at this hospital are accepted by all licensing bodies. Students can enter for attendance at any time, but preference is given to those entering from the first day of the month. Further particulars may be had on application to the Master or the Registrar at the Hospital.

NATIONAL MATERNITY HOSPITAL, Holles-street, Dublin.—Established 1894. The hospital consists of Intern and Extern Maternity, Gynæcological Wards, and a Dispensary for the treatment of Diseases of Women and Children and an antenatal and post-natal branch. Every facility is given for the carrying out of practical work. Undergraduate and post-graduate courses are arranged at any time. Certificates of attendance at this hospital are recognised by all the licensing bodies. Clinical lectures are given daily and Oral lectures four times per week. The L.M. Diploma is given by special examination, which is held three times a year. Further particulars can be obtained from the Master or from the Secretary, Holles-street, Dublin.

ST. VINCENT'S HOSPITAL AND DISPENSARY, Dublin.—Established 1834. 200 beds. Clinical Lectures in Medicine and Surgery are held from October to June. Special classes for Juniors from October to December. Pathological and Bacteriological Demonstrations are given every Thursday, and instructions in the use of Laryngoscope and Otoscope for senior students every Saturday. Medals and Prizes: the Bellingham gold medal in Medicine and the O'Farrell gold medal in Surgery are offered for competition at the end of the summer session, as well as junior prizes, also the for the work of practically instructing students in the compounding and dispensing of medicines.

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* No returns.

Clinical Instruction.—The following institutions are recognised by the University as affording proper opportunities for clinical instruction: the Royal Victoria Hospital, the Mater Infirmorum Hospital, the Union Hospitals, the Belfast Hospital for Sick Children, the Belfast Maternity, the Ulster Hospital for Women and Children, the Ulster Eye, Ear, and Throat Hospital, the Belfast Ophthalmic Hospital, the Purdysburn Fever Hospital, and the Belfast District Lunatic Asylum. Complete information can be obtained from the respective Secretaries.

Royal Victoria Hospital, Belfast, 436 beds.—Students eligible for McGrath, McQuitty, Malcolm, Coulter Smyth and Elwood Scholarships aggregate annual value £185. Twelve House Surgeons and House Physicians. Thirty-six resident pupilships, three months each, annually for Senior Students, of which a proportion is allotted to Women Students, Special Departments for Radiology, Clinical Pathology, V.D., Dermatology, Gynæcology, Vaccine Therapy, Electrocardiography, Dentistry.

Mater Infirmorum Hospital, Belfast.—This hospital contains 270 beds and is open at all hours for the reception of accidents and urgent cases. Clinical instruction is given daily by Physicians and Surgeons. Surgical operations are performed daily. The outpatient departments in Medicine and Surgery, also the special dispensaries for Gynæcology, Ear, Eye and Throat, Electrotherapeutics, Venereal Diseases are very largely attended and afford valuable opportunities to students for the study of those subjects. A House Physician and two House Surgeons are elected every six months. Resident pupils are admitted as the vacancies arise. Three Exhibitions and a Gold Medal are competed for annually in June. Certificates of attendance upon this hospital are recognised by all the Universities and licensing bodies in the United Kingdom.

Belfast Infirmary and Hospital (1600 beds).—Clinical courses are given quarterly, and a course for D.P.H. in Hospital. Intern Venereal Clinic in Infirmary under Corporation scheme. Maternity Hospital recognised for Practical Midwifery training. Particulars may be obtained on application to the Hon. Sec. Visiting Medical Staff. Certificate of vaccination class recognised by Local Government Board. There is a department for Cancer with 32 beds, and X Ray and Bacteriological Departments.

The Belfast Hospital for Sick Children, Queen-street (45 beds).—Clinical instruction is given in this hospital. During the Winter Session two Courses of Lectures are delivered on the Medical and Surgical Diseases incidental to Infancy and Childhood. Demonstrations in Ophthalmology and Pathology are given, and ample opportunities are afforded in the wards and in the Out-patient Department for gaining a practical and theoretical knowledge of the diseases of Infancy and Childhood. This Hospital grants Certificates in Diseases of Children, which are recognised by the various Examining Bodies. Certificates are also granted for post-graduate study. A Gold Medal is offered for competition at the close of the session.

Maternity Hospital, Townsend-street, Belfast.—Twenty-five beds in constant occupation, and exclusively devoted to Midwifery and Antenatal conditions. There is also a large district. The Queen's University of Belfast have erected a Students' Hostel in connexion with the Hospital where six Students and Post-graduates are received each month. The University Tutor in Obstetrics resides in the Hostel and Students conduct their cases under his supervision. There is a large Antenatal Department and a Department for Venereal Diseases. Communications should be made to C. H. G. Macafee, M.B., F.R.C.S., Hon. Secretary of the Medical Staff.

Ulster Hospital for Children and Women, Templemore-avenue, Belfast (57 beds).—Clinical instruction to students in Diseases of Children, Gynæcology and Obstetrics. Special departments: Radiology and Actinotherapy, Eye, Ear, and Throat, V.D. Clinic and Antenatal Clinic. Gold Medal awarded annually. Two House Surgeons appointed from students of hospital.

Benn Ulster Eye, Ear and Throat Hospital, Clifton-street, 30 beds, and **Belfast Ophthalmic Hospital**, Great Victoria-street, 30 beds.—Practical demonstrations by the staff and occasional clinical lectures in the subjects of Ophthalmology, Otology, and Laryngology. Clinical instruction is given daily.

Belfast Fever Hospitals.—City Fever Hospital, Purdysburn (360 beds); Union Fever Hospital (200 beds). Clinical Classes are held during the winter and summer sessions. Post-graduate (D.P.H.) Classes are also held. Dr. A. Gardner Robb, Lecturer and Medical Superintendent.

Belfast Mental Hospital (Purdysburn Villa Colony) (1300 beds). University Lectures and clinics.

IRISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND AND ROYAL COLLEGE OF SURGEONS IN IRELAND.

The Irish Conjoint Board requires of candidates the passage either of its own preliminary examination in the subjects of general education or proof that the candidate has passed one of the tests accepted by the General Medical Council as well as passing in the Pre-Registration Examinations in Chemistry and Physics and Biology.

Professional Examinations.—There are three professional examinations, the first of which cannot be passed earlier than the end of the second winter session, nor the final before the conclusion of full five years of medical study. Before being admitted to any of them the candidate must show that he has studied the different subjects in practice and theory for the requisite periods, certificates to this effect being accepted from the authorities of most of the recognised medical schools at home and abroad. The first examination deals with (*a*) Anatomy, and (*b*) Physiology and Histology. The second examination deals with (*a*) Pathology, (*b*) Materia Medica, Pharmacy, and Therapeutics and Ophthalmology, and may be taken separately.

Final Examination.—This is divided into three divisions, which cannot be completed until at least five years have passed in medical studies other than those for the Pre-Registration Examinations, and five years at least since the beginning of the curriculum. The divisions are (*a*) Medicine, including Fevers, Mental Diseases, and Diseases of Children; (*b*) Surgery, including Operative Surgery; (*c*) Midwifery, including Diseases of Women and Children, and the Practice of Vaccination.

Diploma in Psychological Medicine.—There are two examinations in connexion with this Diploma: Part I. consists of (*a*) Anatomy and Physiology of the Nervous System; (*b*) Psychology. Part II.: (*a*) Neurology, including Clinical and Pathological Neurology: (*b*) Psychological Medicine, including its legal relationships.

Further information can be obtained from the Secretary of the Committee of Management, Royal College of Surgeons, St. Stephen's Green.

is occupied by a Botanic Garden and a portion is at the disposal of the College Athletic Union. There are several student societies in the College, including a Biological Society. There are abundant facilities for research and Post-graduate work in the Chemistry, Physiology, and Pathology departments. There are ample facilities for Women Students. Further information can be obtained from the Registrar of the College.

Clinical Instruction is given in the Galway Tuberculosis Hospital and in the Galway Central and Fever Hospitals, containing on an average 350 patients.

CENTRAL HOSPITAL, GALWAY (300 beds).—In this completely renovated hospital, in addition to the Finer Surgical and Medical Departments, there are now Eye and Ear, Throat and Nose, Gynæcological and Obstetrical, Pathological, X Ray, Ultra-Violet Rays, and Electrical and Massage Departments. Students attend from University College, Galway. Medical and Surgical Clinics are held on alternate days during term. One Resident Physician and one Resident Surgeon are appointed every six months. Arrangements are being made for admission of Resident Students. The hospital is open to qualified medical men for post-graduate work.

QUEEN'S UNIVERSITY OF BELFAST.

There are six degrees in the Faculty of Medicine of the University—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (B.Ch.), Bachelor of Obstetrics (B.A.O.), Doctor of Medicine (M.D.), Master of Surgery (M.Ch.), and Master of Obstetrics (M.A.O.). The University also grants a Diploma in Public Health, particulars of which will be found in the University Calendar. The degrees of M.B., B.Ch., and B.A.O. are the primary degrees in the Faculty of Medicine, and are conferred at the same time and after the same course of study. No student is admitted to the final examination for these degrees until he has shown: (1) that he is a matriculated student of the University; (2) that he has completed the prescribed course of study in the Faculty of Medicine extending over a period of not less than five academic years from the date of his registration as a student of Medicine; (3) that he has passed the several examinations prescribed; (4) that he has attended in the University during three academic years at least the courses of study prescribed for such degrees (the Senate may accept, for not more than two academic years of the required five, courses of study pursued in any other University or School of Medicine approved by the Senate); and (5) that he has attained the age of 21 years. Every candidate for admission shall matriculate or fulfil such other test of fitness as may be prescribed by the Senate, or may be exempted from the matriculation examination by having passed similar examinations elsewhere. For information as to Scholarships and Prizes, inquiry should be made of the Secretary of the University.

Primary Degrees of M.B., B.Ch., B.A.O.—All candidates for these degrees must satisfy the examiners in the subjects of four examinations.

The First Medical Examination.—The subjects of this examination are Chemistry (Inorganic and Organic), Experimental Physics, Botany and Zoology. The examination will be divided into two parts which may be taken separately: I., Chemistry and Physics; II., Botany and Zoology.

The Second Medical Examination.—The subjects are Anatomy and Practical Anatomy, Physiology and Practical Physiology. Candidates who have previously passed the First Medical Examination may present themselves for this examination at the close of their second year.

The Third Medical Examination.—The subjects are: (1) Pathology and Practical Pathology; (2) Materia Medica, Pharmacology and Therapeutics; (3) Medical Jurisprudence; (4) Hygiene. Candidates who have previously passed the Second Medical Examination may present themselves for this examination at the close of the third year. Attendance on a course in any subject of the Third Medical Examination shall not entitle a student to a certificate of attendance unless he has previously passed in all the subjects of the Second Medical Examination.

The Fourth Medical Examination.—The subjects are: (1) Medicine; (2) Surgery; (3) Midwifery; (4) Ophthalmology and Otology. This examination may be taken in two parts: I., Systematic; II., Clinical, Practical and Oral. Candidates who have previously passed the Third Examination may present themselves for Part I. of the Fourth Examination at the close of the fourth year, provided that they have fulfilled the necessary requirements as to attendance, &c., on the courses of instruction in the subjects of examination. Candidates who have passed Part I. of this examination may present themselves for Part II. at the close of the fifth year, provided that they have fulfilled the necessary requirements as to hospital attendance on the various clinical courses in the subjects of examination. Parts I. and II. may be taken together at the close of the fifth year. Attendance on a course in any subject of the Fourth Medical Examination shall not entitle a student to a certificate of attendance unless he has passed in the subjects of the Second Medical Examination.

Degrees of M.D., M.Ch., and M.A.O.—These degrees are not conferred until the expiration of at least three academic years, or in the case of graduates of the University in Arts or Science of at least two academic years, after admission to the primary degrees in the Faculty of Medicine. Every candidate must show that in the interval he has pursued such courses of study, or been engaged in such practical work as may be prescribed. These degrees may be conferred by the Senate either (*a*) after an examination, which includes written, oral, clinical, and practical examinations; or (*b*) on the submission of a thesis or other evidence of original study or research, to be approved by the Faculty of Medicine after an oral or other examination of the candidate on the subject.

The Medical School.—The Donald Currie Chemical Buildings contain a lecture theatre, a preparation room, a chemical museum, a large class-room for elementary practical chemistry, laboratories for qualitative and quantitative analysis, rooms for water and gas analysis, dark room for photographic purposes and balance room, provided with all modern appliances. The Anatomical Department contains a large and well-lighted dissecting-room, a lecture-room, a professor's and demonstrator's room, a bone-room, and a laboratory for microscopic and photographic work. The Medical Museum is in the same building. The Jaffé Laboratories for Physiology comprise a lecture theatre, laboratories for practical work in chemical physiology, histology, and experimental physiology, and in addition small private research rooms, including balance, galvanometer, and centrifuge rooms. The J. C. White laboratories, recently founded, are fully equipped for research in biochemistry and bacteriology. The Musgrave Pathological Laboratory.—In this department opportunity is afforded for research in pathology and bacteriology. The department is in touch with most of the hospitals in Belfast, and there is an ample supply of material for investigation by graduates in morbid histology, clinical pathology, and the bacteriology of infectious diseases. A course in pathology or bacteriology is given to graduates, and members of this class have an opportunity of seeing the methods employed in the various investigations carried out in the department for the Public Health Committee of the Corporation in connexion with water-supply, sewage disposal, meat- and milk-supply, and the diagnosis of cases of infectious diseases. The certificate issued to members of the class in bacteriology qualifies for the D.P.H. degree. The Pharmaceutical Laboratory is fitted and equipped for the work of practically instructing students in the compounding and dispensing of medicines.

Clinical Instruction.—The following institutions are recognised by the University as affording proper opportunities for clinical instruction: the Royal Victoria Hospital, the Mater Infirmorum Hospital, the Union Hospitals, the Belfast Hospital for Sick Children, the Belfast Maternity, the Ulster Hospital for Women and Children, the Ulster Eye, Ear, and Throat Hospital, the Belfast Ophthalmic Hospital, the Purdysburn Fever Hospital, and the Belfast District Lunatic Asylum. Complete information can be obtained from the respective Secretaries.

Royal Victoria Hospital. Belfast, 436 beds.—Students eligible for McGrath, McQuitty, Malcolm, Coulter Smyth and Elwood Scholarships aggregate annual value £185. Twelve House Surgeons and House Physicians. Thirty-six resident pupilships, three months each, annually for Senior Students, of which a proportion is allotted to Women Students, Special Departments for Radiology, Clinical Pathology, V.D., Dermatology, Gynæcology, Vaccine Therapy, Electrocardiography, Dentistry.

Mater Infirmorum Hospital, Belfast.—This hospital contains 270 beds and is open at all hours for the reception of accidents and urgent cases. Clinical instruction is given daily by Physicians and Surgeons. Surgical operations are performed daily. The out-patient departments in Medicine and Surgery, also the special dispensaries for Gynæcology, Ear, Eye and Throat, Electrotherapeutics, Venereal Diseases are very largely attended and afford valuable opportunities to students for the study of those subjects. A House Physician and two House Surgeons are elected every six months. Resident pupils are admitted as the vacancies arise. Three Exhibitions and a Gold Medal are competed for annually in June. Certificates of attendance upon this hospital are recognised by all the Universities and licensing bodies in the United Kingdom.

Belfast Infirmary and Hospital (1600 beds).—Clinical courses are given quarterly, and a course for D.P.H. in Hospital. Intern Venereal Clinic in Infirmary under Corporation scheme. Maternity Hospital recognised for Practical Midwifery training. Particulars may be obtained on application to the Hon. Sec. Visiting Medical Staff. Certificate of vaccination class recognised by Local Government Board. There is a department for Cancer with 32 beds, and X Ray and Bacteriological Departments.

The Belfast Hospital for Sick Children, Queen-street (45 beds).—Clinical instruction is given in this hospital. During the Winter Session two Courses of Lectures are delivered on the Medical and Surgical Diseases incidental to Infancy and Childhood. Demonstrations in Ophthalmology and Pathology are given, and ample opportunities are afforded in the wards and in the Out-patient Department for gaining a practical and theoretical knowledge of the diseases of Infancy and Childhood. This Hospital grants Certificates in Diseases of Children, which are recognised by the various Examining Bodies. Certificates are also granted for post-graduate study. A Gold Medal is offered for competition at the close of the session.

Maternity Hospital, Townsend-street, Belfast.—Twenty-five beds in constant occupation, and exclusively devoted to Midwifery and Antenatal conditions. There is also a large district. The Queen's University of Belfast have erected a Students' Hostel in connexion with the Hospital where six Students and Post-graduates are received each month. The University Tutor in Obstetrics resides in the Hostel and Students conduct their cases under his supervision. There is a large Antenatal Department and a Department for Venereal Diseases. Communications should be made to C. H. G. Macafee, M.B., F.R.C.S., Hon. Secretary of the Medical Staff.

Ulster Hospital for Children and Women, Templemore-avenue, Belfast (57 beds).—Clinical instruction to students in Diseases of Children, Gynæcology and Obstetrics. Special departments: Radiology and Actinotherapy, Eye, Ear, and Throat, V.D. Clinic and Antenatal Clinic. Gold Medal awarded annually. Two House Surgeons appointed from students of hospital.

Benn Ulster Eye, Ear and Throat Hospital, Clifton-street, 30 beds, and Belfast Ophthalmic Hospital, Great Victoria-street, 30 beds.—Practical demonstrations by the staff and occasional clinical lectures in the subjects of Ophthalmology, Otology, and Laryngology. Clinical instruction is given daily.

Belfast Fever Hospitals.—City Fever Hospital, Purdysburn (360 beds); Union Fever Hospital (200 beds). Clinical Classes are held during the winter and summer sessions. Post-graduate (D.P.H.) Classes are also held. Dr. A. Gardner Robb, Lecturer and Medical Superintendent.

Belfast Mental Hospital (Purdysburn Villa Colony) (1300 beds). University Lectures and clinics.

IRISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND AND ROYAL COLLEGE OF SURGEONS IN IRELAND.

The Irish Conjoint Board requires of candidates the passage either of its own preliminary examination in the subjects of general education or proof that the candidate has passed one of the tests accepted by the General Medical Council as well as passing in the Pre-Registration Examinations in Chemistry and Physics and Biology.

Professional Examinations.—There are three professional examinations, the first of which cannot be passed earlier than the end of the second winter session, nor the final before the conclusion of full five years of medical study. Before being admitted to any of them the candidate must show that he has studied the different subjects in practice and theory for the requisite periods, certificates to this effect being accepted from the authorities of most of the recognised medical schools at home and abroad. The first examination deals with (*a*) Anatomy, and (*b*) Physiology and Histology. The second examination deals with (*a*) Pathology, (*b*) Materia Medica, Pharmacy, and Therapeutics and Ophthalmology, and may be taken separately.

Final Examination.—This is divided into three divisions, which cannot be completed until at least five years have passed in medical studies other than those for the Pre-Registration Examinations, and five years at least since the beginning of the curriculum. The divisions are (*a*) Medicine, including Fevers, Mental Diseases, and Diseases of Children; (*b*) Surgery, including Operative Surgery; (*c*) Midwifery, including Diseases of Women and Children, and the Practice of Vaccination.

Diploma in Psychological Medicine.—There are two examinations in connexion with this Diploma: Part I. consists of (*a*) Anatomy and Physiology of the Nervous System; (*b*) Psychology. Part II.: (*a*) Neurology, including Clinical and Pathological Neurology; (*b*) Psychological Medicine, including its legal relationships.

Further information can be obtained from the Secretary of the Committee of Management, Royal College of Surgeons, St. Stephen's Green.

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The Licence in Midwifery.—Candidates must produce certificates of registration. A registered medical practitioner of five years' standing may be exempted from the examination by printed questions.

The Membership.—Examinations for Membership are held in February, June, and November.

The Fellowship.—Fellows are elected by ballot. Applicants must have been a Member of the College for at least one year and must have attained the age of 27 years.

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Candidates are examined in General Surgery (paper and oral), Clinical Surgery, Surgical Pathology (oral), Operative Surgery, Surgical Anatomy (paper), and Ophthalmic and Aural Surgery (clinical).

Diploma in Midwifery.—A diploma in Midwifery is granted after examination to persons possessing a registrable qualification.

Fellowship Examinations.—Candidates for the Fellowship shall make application to the President and Council to be admitted to examination. They are required to pass two examinations—Primary and Final. Candidates may present themselves for the Final Examination immediately after passing the Primary part, provided they have complied with the necessary regulations. The subjects for the Primary Examination are (*a*) Anatomy, including Dissections; and (*b*) Physiology and Histology. The subjects for the Final Examination are Surgery, including Surgical Anatomy and Pathology. For admission to the Final Examination the candidate must have passed the Primary Examination, and must be a Licentiate or Graduate in Surgery of a university or licensing body recognised by the General Medical Council; all such candidates must not be less than 25 years of age.

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APOTHECARIES' HALL OF IRELAND.*

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The subjects for Part I. of the Primary Examination are: Anatomy, Physiology and Histology, including Bio-Chemistry; and for Part II., Materia Medica and Pharmacy, Pathology, and Medical Jurisprudence and Hygiene.

For the Final Examination the subjects are: (*a*) Medicine and Clinical Medicine and Clinical Methods. (*b*) Surgery—Clinical, Ophthalmic and Operative; and Surgical Anatomy. (*c*) Midwifery and Gynæcology, and Practical Pharmacy and Materia Medica (if not taken at Intermediate Examination).

Each candidate before receiving his diploma must produce evidence that he has attained the age of 21 years. The details of the course of education required and syllabus of the examinations will be supplied by the Registrar at 95, Merrion-square, Dublin.

WE take this opportunity of thanking the officials of Government Departments and the Deans and Secretaries of the various institutions for their kind coöperation in enabling us to bring the information contained in our Students' Number up to date.

GUILD OF ST. LUKE.

THE Guild of St. Luke was founded over 60 years ago by a few medical students, chiefly to meet their own religious needs. It now makes a wider appeal, and its membership is open to all students and practitioners of medicine, both men and women, who are members of the Church of England, the clergy of which are eligible as Clerical Associates. The Chapter meets in every month of each term, and a festival service is held yearly at St. Luke's tide, usually at St. Paul's or Westminster Abbey. This year the service will be at the Abbey. Besides the parent Guild, there are a Women's Ward and a Hospital Student's Branch in London. There are also a Midland Counties Ward and a Cambridge Ward. Particulars of the objects and activities of the Guild and forms of application for membership can be obtained from the Secretary of the Guild of St. Luke, Room B.B., King's College, Strand, W.C.2.

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* No returns.

THE LANCET.

LONDON: SATURDAY, AUGUST 25, 1928.

THE READJUSTMENT OF THE MEDICAL CURRICULUM.

DURING the past 12 months no public aspect of the calling of medicine has been seriously altered, no legal enactment has introduced any big departure into professional life, and no pronouncements of the General Medical Council have resulted in any radical changes of the curriculum. The tendency in London to segregate medical study as between men and women students may be only a passing phase. The numbers of the medical profession in practice have remained virtually stable, while the same can be said in general terms of the population of the Empire, so that no situation has been created attributable either to an excessive or deficient number of our calling; there is still keen competition in some quarters, and there is still much room for the right man in others. But the static conditions do not imply any pause in progress, for the absence of marked episode has synchronised with much steady work along educational lines previously laid down.

For example, there may be cited the advance made throughout the country towards the readjustment of the medical curriculum in accordance with the resolutions of the General Medical Council passed some six years ago. These resolutions came into force on Jan. 1st, 1923, and their result has been the occurrence of important deliberations in the Council, the various questions arising being dealt with in reports by the Education Committee, and made the subject of correspondence between the Committee and the centres of medical education. The gist of the work of the Council has been to arrange an orderly and common course of study as a minimum standard for the centres, while safeguarding entry to the profession by an examination ensuring that before registration the student must have passed a recognised examination in general education and, in addition, an examination in elementary chemistry and physics either conducted by, or recognised by, one of the licensing bodies. The registered student will in this way, theoretically, have broken ground in two basic directions of his professional work while being generally equipped up to a professional standard. After registration the resolutions of the Council in regard to professional education provide that the period of professional study between the date of registration as a medical student and the date of the final examination for any diploma entitling to registration should extend over not less than five academic years. That is to say, the student should have passed the examination in general education and the pre-registration examination and have commenced study at a medical school before he can be registered, after which the time required is a minimum of five academic years, or, say, 57 months. The proposal for a pre-registration examination was of course made with the object of lightening the preliminary portion of the medical course, the assistance of various educational agencies, particularly the higher secondary schools, being called in to assist in laying a scientific foundation for medical students. This reform was advocated in our columns and elsewhere many years ago, but failed to find support owing to the feeling that the unequal distribution in the kingdom of these secondary schools would act prejudicially for some of the students, but a wider and wiser view now obtains. Other primary and additional resolutions of the Council dealt with the course and examinations of the whole curriculum, suggesting the ground that must be covered by general and special study and the best way in which to allot the time available, when the whole document, in the form of an Interim Report of the Education Committee, was submitted to the various educational centres, who were invited to make comment upon them. They were asked, in fact, to indicate how far their existing patterns of training complied with those advocated by the Council, and the resulting replies disclosed both a satisfactory state of affairs in being and a general willingness to meet the new requirements—this not only in respect of the pre-registration examination and the arrangement of the five years' course, but along many special lines of academic and practical instruction. The replies of the licensing bodies were later published in the Final Report of the Education Committee and the information summarised in this issue of THE LANCET is in accord with them.

Those, then, who are now joining our ranks enter a profession where the steps of their training will be guided with a precision that until quite recently was unknown. This lucid charting of the voyage will be found valuable to many, and indeed to all, for both industry and attention will have to be sustained by them for an extended period. The Council is to be congratulated upon the outcome of delicate and protracted labours in readjusting the curriculum; but it may be pointed out that the whole spirit of these labours, as well as their issue at the present moment, proves that the curriculum will always need readjustment in accordance with the developments of medical science. For example, throughout the latest pourparlers no particular stress appears to have been laid either by the Council or by the licensing bodies on the difficult subject of practical instruction in midwifery, and during the period that has elapsed since the Final Report of the Education Committee on readjustment was published, this question has become burning. Among the various subjects specially recommended for study by the Council, tuberculosis, venereal diseases, and antenatal conditions appeared to the Education Committee to be of particular importance, so much so that, at the request of the Committee, Sir GEORGE NEWMAN prepared a personal report on the subject, which has now been circulated to the licensing bodies. Progress along these lines should help to prevent the sad divergence between preventive and curative medicine. All these licensing bodies provide systematic instruction in midwifery over a fair proportion of the five years' course, and all students are compelled, in addition, to conduct an adequate number of labours within a recognised institution or, under supervision, as clinical visitants at the homes of the patients. But undoubtedly more will be expected. The intentions of all the licensing bodies are admirable, but it is common knowledge that the midwifery training of students, speaking generally, requires strengthening on the practical side. This is a circumstance which will have to be borne in mind when the methods for securing coöperation between the voluntary hospitals and the county institutions are under discussion—as they will immediately be; while the new diploma of the Society of Apothecaries of London demonstrates that a higher standard of obstetric and gynæcological accomplishment is necessary. Midwifery has always been the keystone of general practice.

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* No returns.

As in the case of the medical branch, 20 per cent. of the rates of full pay, unemployed pay, half pay, and retired pay introduced in 1919 is considered as due to the high cost of living in 1919 and subject to change periodically either upwards or downwards according as the cost of living rises or falls. The first revision took place in July, 1924, when all the rates were reduced by approximately 5½ per cent., the second revision took place in July, 1927, when all rates were reduced by ½ per cent., and further revisions are due every three years—i.e., in July, 1930, and so on.

ARMY MEDICAL SERVICE.

ROYAL ARMY MEDICAL CORPS.

THE publication of the Royal Warrant of 1926 has removed many of the grievances of officers of the Corps, and this Service can again be recommended as a career to young medical men. Competitive examinations for regular commission, which have been in abeyance for some time, will again be held half-yearly in January and July. These examinations in medicine and surgery are entirely of a clinical and practical character, partly written and partly oral.

The regulations for admission giving full details should be obtained from the Permanent Under Secretary of State (A.M.D. 1), War Office, Whitehall, London, S.W. 1, and carefully studied. A personal interview with a representative of the Director-General, Army Medical Services, is readily obtainable.

The rates of pay and allowances are good; the opportunities of post-graduate study are generous, and the work is varied, responsible, and interesting. The gratuities after certain periods of service enable an officer should he so desire to leave the Service with a capital sum large enough to go a long way towards re-establishing himself in civil life, and, further, the knowledge of the world and the comradeship of his fellow officers that he has gained in the Army will be of no small value to him.

New entrants are commissioned in the rank of Lieutenant, and the first six months of service are spent on probation, during which time they undergo, in addition to their Military training at the Royal Army Medical Corps Depôt at Aldershot, a probationary course at the Royal Army Medical College in London in Hygiene, Pathology, Tropical Medicine, Military Surgery, Recruiting, the prevention and treatment of Venereal Disease, and the elements of Army Administration. At the end of this course, and after qualifying at the necessary examinations, their commissions are confirmed, and they take their places in seniority according to the total marks obtained at all examinations up to that date. Officers Training Corps service with possession of Certificates "A" or "B" (Medical) carry a definite value in marks in this total.

An entrant who is holding or about to hold at the time of the entrance examination a resident House Appointment at an approved Civil Hospital may be seconded while holding such an appointment up to a maximum period of 12 months. A candidate who has held such an appointment within six months of entry may be granted an antedate up to 12 months in respect of the period the appointment was held. This secondment and antedate counts in all respects as commissioned service, except that pay will not be issued for that period.

After a total period of one year's service at home the young officer goes abroad, probably to India, for his first tour of foreign service. Here he gains his first practical experience of tropical disease and tropical hygiene, and possibly his first experience of active service on the frontiers of India. His tour abroad lasts five years, with probably six months' leave home during that time. On returning home the R.A.M.C. officer has the opportunity to decide whether he will remain in the Corps or accept the gratuity of £1000 after seven years' service, and try his fortune in civil life. If he elects to remain, he will, between his eighth and twelfth year of service, undergo a course of post-graduate study at the Royal Army Medical College and the London Hospitals of five months' duration, followed by a course of study of a special subject selected by himself, provided he has shown special aptitude in the post-graduate course or during his previous service. During this period of study he remains on full pay, and the fees for the courses are paid by the State. When qualified in his special subject, the officer becomes entitled to specialist pay at 5s. per day when holding a specialist appointment. After this post-graduate course the officer probably proceeds abroad again and promotion to Major rapidly ensues, and from that time onward the officer receives regular successive increases of pay, and is eligible for additional and charge pay as well. The Directorates of Hygiene and Pathology and the appointment of two serving officers as Consultants in Medicine and Surgery have been instituted and have proved a marked success, all these appointments being of the rank of Colonel or Major-General.

Under *these conditions* the possibilities for good workers are very great in the Royal Army Medical Corps. There is scope for original research in tropical

PAY AND ALLOWANCES.

Rank.	Pay per diem.*	Rations.†	Servant.	Married.			Unmarried.		Approximate daily total.		Approximate yearly total.	
				Lodging.	Fuel and light (average)	Furniture allowance.	Lodging.	Fuel and light (average)	Married.	Unmarried.	Married.	Unmarried.
	£ s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£ s. d.	£ s. d.	£	£
Lieutenant	1 0 8	1 7	2 0	3 6	1 5	2 0	2 3	1 2	1 11 2	1 7 8	569	506
Captain—	1 5 4	1 7	2 0	4 6	3 0	2 0	3 0	1 8	1 18 5	1 13 6	701	612
After 8 years c.s...	1 8 2	1 7	2 0	4 6	3 0	2 0	3 0	1 8	2 1 3	1 16 5	752	661
After 16 years c.s.	1 10 6	1 7	2 0	4 6	3 0	2 0	3 0	1 8	2 3 7	1 18 9	795	707
Major—	1 15 4	1 7	2 0	4 6	3 0	2 0	4 0	2 3	2 8 5	2 5 2	883	824
After 15 years c.s.	2 0 0	1 7	2 0	4 6	3 0	2 0	4 0	2 3	2 13 1	2 9 10	968	909
After 18 years c.s.	2 2 4	1 7	2 0	4 6	3 0	2 0	4 0	2 3	2 15 5	2 12 2	1011	952
After 20 years c.s.	2 7 0	1 7	2 0	4 6	3 0	2 0	4 0	2 3	3 0 1	2 16 10	1095	1037
Lieut.-Colonel ..	2 11 0	1 7	2 0	4 6	3 0	2 0	4 6	2 3	3 7 1	3 4 1	1224	1174
After 3 years c.s. as such	2 18 11	1 7	2 0	4 6	3 0	2 0	4 6	2 3	3 11 11	3 9 2	1312	1262
Colonel	3 5 10	1 7	2 0	5 6	4 1	2 0	5 6	2 9	4 1 0	3 17 8	1478	1419
Major-General ..	4 9 4	1 7	4 0	11 0	5 2	2 0	11 0	3 8	5 13 1	5 9 7	2064	2000

c.s. = commissioned service.

* Pay Warrant rates as amended by A.O. 196/26 less 6 per cent. from July 1st, 1927, vide A.O. of 1927. The Pay Warrant rates are subject to revision to an extent not exceeding 20 per cent. according to variation in the cost of living. The next revision takes place from July 1st, 1930.

† Rates of allowances vary from time to time and issues are subject to conditions laid down in the Allowance Regulations.

The Medical Services.

ROYAL NAVAL MEDICAL SERVICE.

CHOOSING A CAREER.

To a man of the proper temperament, a career as a medical officer in the Royal Navy offers very definite attractions. In these days his professional knowledge will most certainly not rust in this Service, and in the naval hospitals he will have opportunities of practising every branch of his profession except gynæcology. He can obtain one of 60 paid specialist appointments, and these fall under the headings of medicine; surgery; bacteriology and pathology; hygiene; diseases of eyes, nose, ear, and throat; radiology; anæsthetics; genito-urinary and venereal diseases; and the principles of physical training. He will be encouraged to work hard and will have chances to play hard. The Navy was possibly the first public Service to realise the value of recreation, and puts its provision into practice, and there is no branch of athletics or field sports in which the naval officer does not have an opportunity of engaging in, in a home port or on a foreign station. He will see the world largely and often under ideal conditions. A naval medical officer who is a good doctor, keen on work and play, and unselfish, invariably becomes everybody's friend. The naval officer and the bluejacket are quick to recognise a medical officer who is keen on his work, thoughtful for his patients, and one who strives after improving the health of the Navy. And nowhere can one find more delightful friends than in the Navy.

There is to-day much to encourage the right type of medical man to join the Navy. The Admiralty allow an ante-date of one year to those naval surgeons who before entry held a resident appointment for one year at certain large hospitals, and encourage men to take higher qualifications. Opportunities to this end are freely given, when the exigencies of the Service will permit, and medical officers are able to take post-graduate courses prior to sitting for these higher examinations. As a matter of fact, a large number of naval medical officers since joining the Navy have taken various honour qualifications as well as special diplomas, and it is recognised that this is good for the Navy as well as for the officer. In the large naval hospitals, the medical, surgical, and specialist work is of a high standard. It is exacting, but it is the aim of the Admiralty to arrange appointments as far as possible so that medical officers have an opportunity of alternating their work both at home and abroad, and ashore and afloat. And to give naval surgeons full opportunities for professional work the general and specialist courses have been increased in number so that, as far as possible, every officer shall have a course of instruction of not less than four months' duration every four years. The number of specialists allowed is now 60 instead of 46, and the specialist allowance is 5*s.* a day instead of 2*s.* 6*d.* a day. The establishment of surgeon captains has been increased from 16 to 20.

The total number of medical officers in the Navy is 402, and every recent improvement has been made towards giving increased opportunities of advancement to the best men, in their science, in research, and in organisation. He has opportunities to emulate some of the great naval physicians and surgeons of the past.

Pay.

The cost of living in the Navy is cheap, and an officer can live on his pay and enjoy life if he is not extravagant, especially if he does not embark in matrimony too early. A small amount of private means goes much further in the Navy than in civil life. The three vital points—pay, prospects, and promotion—of the naval medical officer can be grasped by referring to the following clear and brief table.

FULL PAY.

		£		£	
SURGEON LIEUTENANT (short service and permanent service)	from	152	to	499	per annum.
SURGEON LIEUTENANT-COMMANDER (promoted after six years' service)..	,,	600	to	630	,,
SURGEON COMMANDER (promoted after a further six years' service)..	,,	772	to	976	,,
SURGEON CAPTAIN (promoted by selection)	,,	1116	to	1372	,,
SURGEON REAR-ADMIRAL (promoted by selection)		1800			
MEDICAL DIRECTOR-GENERAL (Surgeon Vice-Admiral) ..		2350			

Allowances.

Allowances when in charge of hospitals and sick-quarters ..	10*s.* and 5*s.* per diem.
Sixty Specialist allowances of ..	5*s.* per diem.
Allowances to Senior Medical Officers in flag ships ..	5*s.* and 2*s.* 6*d.* per diem.

Accelerated promotion can be gained under certain conditions; there are also, on certain occasions, servant's allowance, provision allowance, and lodging allowance.

PENSION.

	Maximum retired pay.			
SURGEON VICE-ADMIRAL ..	£1123 per annum, on vacating office.			
SURGEON REAR-ADMIRAL ..	£950 per annum, at age of 60.			
SURGEON CAPTAIN	£846	,,	,,	55.
SURGEON COMMANDER	£564	,,	,,	50.
SURGEON LIEUTENANT-COMMANDER AND SURGEON LIEUTENANT	£423	,,	,,	45.

Gratuities on Retirement.

Below age of 45, officers receive gratuities on retirement on the following scale:—

				£
After	4	years' service	.. ..	500
,,	8	,, ,,	.. ..	1000
,,	12	,, ,,	.. ..	1500
,,	18	,, ,,	.. ..	2250

The extra allowances alluded to in the table are not to be looked upon as very exceptional. About a quarter of the medical officers of the Navy are drawing extra allowances. Of recent years medical officers have been admitted into the Navy without entrance examination and for short service with the option of turning over to the permanent service, but it is anticipated that it will not be long before the Admiralty will revert to the old-established system of entrance by competitive examination twice a year in batches of about ten officers.

DENTAL BRANCH.

The Naval Dental Service offers similar opportunities to qualified dental surgeons except that higher rank than that of the recently instituted Surgeon Captain (D) is not open to them. They are provided with suitable surgery accommodation equipped with modern appliances and supplied with all material required for their work, and there is every opportunity for them to maintain a high standard of professional skill.

Candidates are required to produce certificates of birth, registration, and of character, and must be physically fit for active service anywhere. An outfit allowance of £50 is payable to officers finally entered and commissioned. The rank of Surgeon Lieutenant-Commander (D) is attained o[illegible] six years' satisfactory service. [illegible] on Commander (D) and Surgeon Cap[illegible] de strictly by selection from the rank next below and are confined to officers who prove fitted in every respect for these ranks. The present establishment of dental officers is: 1 Surgeon Captain (D), 3 Surgeon Commanders (D), 60 Surgeon Lieutenant-Commanders (D) and Surgeon Lieutenants (D).

Provision has been made for candidates who, at the time of passing the examination, hold or are about to hold an appointment as Dental Officer in a recognised Civil Hospital. The time concerned, provided it does not exceed six months, may reckon for increase of full pay while on the active list. Surgeon Lieutenant-Commanders (D) of over two years' seniority will be eligible for a three months' Post-graduate Course while borne on full pay.

As in the case of the medical branch, 20 per cent. of the rates of full pay, unemployed pay, half pay, and retired pay introduced in 1919 is considered as due to the high cost of living in 1919 and subject to change periodically either upwards or downwards according as the cost of living rises or falls. The first revision took place in July, 1924, when all the rates were reduced by approximately 5½ per cent., the second revision took place in July, 1927, when all rates were reduced by ½ per cent., and further revisions are due every three years—i.e., in July, 1930, and so on.

ARMY MEDICAL SERVICE.

ROYAL ARMY MEDICAL CORPS.

THE publication of the Royal Warrant of 1926 has removed many of the grievances of officers of the Corps, and this Service can again be recommended as a career to young medical men. Competitive examinations for *regular commission*, which have been in abeyance for some time, will again be held *half-yearly in January and July*. These examinations in medicine and surgery are entirely of a clinical and practical character, partly written and partly oral.

The regulations for admission giving full details should be obtained from the Permanent Under Secretary of State (A.M.D. 1), War Office, Whitehall, London, S.W. 1, and carefully studied. A personal interview with a representative of the Director-General, Army Medical Services, is readily obtainable.

The rates of pay and allowances are good; the opportunities of post-graduate study are generous, and the work is varied, responsible, and interesting. The gratuities after certain periods of service enable an officer should he so desire to leave the Service with a capital sum large enough to go a long way towards re-establishing himself in civil life, and, further, the knowledge of the world and the comradeship of his fellow officers that he has gained in the Army will be of no small value to him.

New entrants are commissioned in the rank of Lieutenant, and the first six months of service are spent on probation, during which time they undergo, in addition to their Military training at the Royal Army Medical Corps Depôt at Aldershot, a probationary course at the Royal Army Medical College in London in Hygiene, Pathology, Tropical Medicine, Military Surgery, Recruiting, the prevention and treatment of Venereal Disease, and the elements of Army Administration. At the end of this course, and after qualifying at the necessary examinations, their commissions are confirmed, and they take their places in seniority according to the total marks obtained at all examinations up to that date. Officers Training Corps service with possession of Certificates "A" or "B" (Medical) carry a definite value in marks in this total.

An entrant who is holding or about to hold at the time of the entrance examination a resident House Appointment at an approved Civil Hospital may be seconded while holding such an appointment up to a maximum period of 12 months. A candidate who has held such an appointment within six months of entry may be granted an antedate up to 12 months in respect of the period the appointment was held. This secondment and antedate counts in all respects as commissioned service, except that pay will not be issued for that period.

After a total period of one year's service at home the young officer goes abroad, probably to India, for his first tour of foreign service. Here he gains his first practical experience of tropical disease and tropical hygiene, and possibly his first experience of active service on the frontiers of India. His tour abroad lasts five years, with probably six months' leave home during that time. On returning home the R.A.M.C. officer has the opportunity to decide whether he will remain in the Corps or accept the gratuity of £1000 after seven years' service, and try his fortune in civil life. If he elects to remain, he will, between his eighth and twelfth year of service, undergo a course of post-graduate study at the Royal Army Medical College and the London Hospitals of five months' duration, followed by a course of study of a special subject selected by himself, provided he has shown special aptitude in the post-graduate course or during his previous service. During this period of study he remains on full pay, and the fees for the courses are paid by the State. When qualified in his special subject, the officer becomes entitled to specialist pay at 5s. per day when holding a specialist appointment. After this post-graduate course the officer probably proceeds abroad again and promotion to Major rapidly ensues, and from that time onward the officer receives regular successive increases of pay, and is eligible for additional and charge pay as well. The Directorates of Hygiene and Pathology and the appointment of two serving officers as Consultants in Medicine and Surgery have been instituted and have proved a marked success, all these appointments being of the rank of Colonel or Major-General.

Under these conditions the possibilities for good workers are very great in the Royal Army Medical Corps. There is scope for original research in tropical

PAY AND ALLOWANCES.

Rank.	Pay per diem.*	Batman.†	Servant.†	Married.			Unmarried.		Approximate daily total.		Approximate yearly total.	
				Lodging.	Fuel and light (average)	Furniture allowance.	Lodging.	Fuel and light (average)	Married.	Unmarried.	Married.	Unmarried.
	£ s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£ s. d.	£ s. d.	£	£
Lieutenant	1 0 8	1 [illegible]	2 0	3 6	1 5	2 0	2 3	1 2	1 11 2	1 [illegible] 8	529	506
Captain—	1 5 4	1 [illegible]	2 0	4 6	3 0	2 0	3 0	1 8	1 18 3	1 13 6	701	612
After 5 years c.s. ..	1 8 2	1 [illegible]	2 0	4 6	3 0	2 0	3 0	1 8	2 1 3	1 16 5	752	664
After 10 years c.s.	1 10 6	1 [illegible]	2 0	4 6	3 0	2 0	3 0	1 8	2 3 3	1 18 9	795	[illegible]
Major—	1 15 4	1 [illegible]	2 0	4 6	3 0	2 0	4 0	2 3	2 8 5	2 5 2	883	824
After 15 years c.s.	2 0 0	1 [illegible]	2 0	4 6	3 0	2 0	4 0	2 3	2 13 1	2 9 10	958	919
After 18 years c.s.	2 2 4	1 [illegible]	2 0	4 6	3 0	2 0	4 0	2 3	2 15 [illegible]	2 12 2	1011	952
After 20 years c.s.	2 [illegible] 0	1 [illegible]	2 0	4 6	3 0	2 0	4 0	2 3	3 0 1	2 16 10	1095	1037
Lieut.-Colonel ..	2 11 0	1 [illegible]	2 0	4 6	3 0	2 0	4 6	2 3	3 7 1	3 4 4	1224	1174
After 3 years c.s. as such ..	2 18 10	1 [illegible]	2 0	4 6	3 0	2 0	4 6	2 3	3 11 11	3 9 2	1312	1262
Colonel	3 5 10	1 [illegible]	2 0	5 6	4 1	2 0	5 6	2 3	4 1 0	3 17 8	1477	1419
Major-General ..	4 9 4	1 [illegible]	4 0	11 0	5 2	2 0	11 0	3 8	5 13 1	5 9 7	2064	2000

c.s. = commissioned service.

* Pay Warrant rates as amended by A.O. 196/26 less 6 per cent. from July 1st, 1927, vide A.O. of 1927. The Pay Warrant rates are subject to revision to an extent not exceeding 2½ per cent. according to variation in the cost of living. The next revision takes place from July 1st, 1930.

† Rates of allowances vary from time to time and issues are subject to conditions laid down in the Allowance Regulations.

disease, in preventive medicine, and in bacteriology, as well as in the large clinical field open to the specialist in Medicine, Surgery or Gynæcology, in Venereal Disease, and in Ophthalmology. Child welfare is also undertaken systematically by officers of the Royal Army Medical Corps.

At the same time instruction in administration is continuous. The Royal Army Medical Corps is essentially organised for war, and one of the lessons of the Great War was that trained administrators must exist to enable the fullest benefit to be obtained from professional talent. Many appointments carrying administrative responsibility are open to those officers who display capacity for this duty. All officers must be prepared to undertake command and to have a knowledge of Army administration, especially in war. Equally important is the technical training of the Non-commissioned Officers and men of the Corps in such "trades" as Trained Nurse, Nursing Orderly, Masseur, Radiographer, Operating Room Assistant, Laboratory Assistant, Hospital Cook, Dispenser, &c. This training is carried out by the Officers and Nursing Sisters, and opens a large field for those who have ability in lecturing and teaching as well as the power of influencing men.

Promotion.

Promotion takes place automatically to Captain after 3½ years, and to Major after 12 years' service, provided the officer is qualified and recommended for promotion. Promotion to the higher ranks is by selection from those senior in the rank below, but special promotion by brevet or otherwise is open to officers of the Royal Army Medical Corps.

Additional Pay and Charge Pay for R.A.M.C. Officers.

(1) Officer not above the rank of lieutenant-colonel, while acting as specialist in a post considered by Our Army Council to merit the grant of additional pay, according to subjects or groups of subjects as under.

Operative Surgery, advanced; Medicine; Ophthalmology; Gynæcology and Midwifery; Dermatology, and Venereal Disease. Otology, Laryngology, and Rhinology; Radiology; Anæsthetics; Mental Diseases; Hygiene; Pathology; subjects other than above, at the discretion of Our Army Council, 5s. daily.

(2) (*a*) Officer in charge of a hospital.—If the number of equipped beds, as certified by the Deputy Director of Medical Services, exceeds—

50 beds	.. 2*s.* 6*d.* daily.	300 beds ..	7*s.* 6*d.* daily.
150 "	.. 5*s.* 0*d.* "	500 " ..	10*s.* 0*d.* "

Officer in charge of a medical or surgical division of a general hospital with not less than 300 beds—half the above rates.

	Daily. *s.*	*d.*
(*b*) Senior medical officer, Royal Arsenal, not exceeding	10	0
(*c*) Officer in command of the depôt, Royal Army Medical Corps	5	0
(*d*) The senior officer of the Army Medical Services with an army in the field: A rate to be fixed by the Army Council according to the magnitude of the charge.		
(*e*) The officer, if under the substantive rank of colonel, holding the appointment of senior medical officer in a command abroad, or of assistant director of medical services, if the number of soldiers is 1500 or upwards	5	0
(*f*) Adjutant R.A.M.C. Depôt	5	0
(*g*) Adjutant R.A.M.C. (Territorial Army)	2	6

Retirement and Retired Pay.

The following are the rates of pension and retired pay:—

1. Retired pay will consist of two parts: (*a*) a service element based on the officer's total service; (*b*) a rank element for the rank from which the officer retires. An officer with less than 20 complete years' service will not be eligible for retired pay.

2. The scale will be as follows, subject to the reduction of 6 per cent. referred to below:—

(*a*) Service element.—£15 a year for each completed year of service as a medical officer.

(*b*) Rank element.—

Rank from which retired.	After completing 1 year's service in the rank.	After completing each additional year's service.	Maximum rank element.
	£	£	£
Major	12	12	120
Lieutenant - Colonel	150	30	240
Colonel	290	50	390
Major-General ..	440	50	540
Lieutenant - General	590	50	690

The retired pay of an officer retiring with less than one complete year's service in the rank from which he retires will be assessed as though he had retired from the rank below.

Maximum rates of retired pay (*a*) and (*b*) together:—

	£		£
Captain and Subaltern ..	300	Colonel	800
Major	450	Major-General ..	1000
Lieutenant-Colonel ..	600	Lieutenant-General	1200

The above rates are those laid down in the Pay Warrant. They have been reduced by approximately 6 per cent. as from July 1st, 1927, and are subject to future variation with fluctuation in the cost of living.

3. Officers with seven and less than 20 years' service as medical officers may be permitted to retire with a gratuity in accordance with the following scale:—

After 7 years' service as a medical officer.. ..	£1000
" 15 " " " ..	£2800
" 18 " " " ..	£3500

THE ARMY DENTAL CORPS.

The Corps is administered by the Director-General, Army Medical Services. It is a joint service for the Army and Royal Air Force, and personnel is required to serve under either force and be interchangeable. Officers and other ranks posted for duty with the Royal Air Force will perform their duties under the Regulations of the Royal Air Force for the employment of dental personnel, but the conditions in the following tables apply equally in either force. Promotion is carried out on one general list. Regulations for admission to the Army Dental Corps should be obtained from the Under-Secretary of State, War Office, and carefully studied.

OFFICERS: *Appointment and Promotion.*

1. Commissions as Lieutenants in the Army Dental Corps may be given to persons duly qualified under regulations approved by the Army Council.

2. An officer shall be eligible for promotion to the rank of Captain on completion of three and a half years' service and to the rank of Major on completion of 12 years' service in the Corps, provided he has previously qualified in such manner as may be prescribed by the Army Council.

3. Promotion to the rank of Lieutenant-Colonel and Colonel to fill the establishments laid down from time to time for those ranks shall be made by selection of the Army Council, provided the officer has previously qualified for promotion to those ranks in such manner as may be prescribed by the Army Council.

4. Appointments are in the rank of Lieutenant, except in cases where service of three and a half years or more has been given as a temporary dental officer, when the rank of Captain will be given. Service as a temporary dental officer will count towards the three and a half years for promotion to captain, and the 12 years for promotion to Major.

Pay.

The following are the rates for officers of the Army Dental Corps:—

	Per diem. £	*s.*	*d.*
Lieutenant	0	18	10
Captain	1	3	6
Captain (after 8 years' total service	1	6	1
Captain " 10 " " "	1	8	2
Major	1	12	10
Major, after 15 years' total service	1	17	5
" " 18 " " "	2	0	0
" " 20 " " "	2	4	8
Lieutenant-Colonel	2	11	8
Lieutenant-Colonel after 3 years' service as such	2	16	4
Colonel	3	3	6

These rates are 6 per cent. below those shown in the Pay Warrant, 1926, as amended by Army Order 106/26.

The latter are subject to revision to an extent not exceeding 20 per cent., according to variation in the cost of living. The next revision takes place on July 1st, 1930.

Charge Pay.

The officer in charge of the Dental Laboratories, Aldershot, receives charge pay at the rate of 5s. a day if holding the rank of Captain, or 2s. 6d. a day if holding the rank of Major.

Allowances.

The allowances for officers of the Army Dental Corps are at the same rates as for officers of the Royal Army Medical Corps.

Retirement and Retired Pay or Gratuity.

(1) The rates of retired pay will be the same as for officers of the Royal Army Medical Corps.

(2) Voluntary retirement on retired pay will not be allowed until after twenty years' service.

(3) Earlier retirement on gratuity may be allowed :—

After 8½ years'	service as a Dental Officer,	gratuity of £1000.
,, 15 ,,		,, £2000.
,, 18 ,,		,, £3000.

The aim of the Corps is the prevention of wastage of man power on account of dental disease or dental deficiency, and, to enable this to be carried out, every recruit is inspected by a dental officer immediately after joining and all necessary treatment carried out. The soldier is re-inspected at least once a year and his dental efficiency maintained at the best standard possible. As recruits are not now enlisted unless they have sufficient natural teeth to enable them to masticate efficiently, it is hoped that the conservative nature of the treatment they will receive will reduce considerably the percentage of artificial dentures required.

INDIAN MEDICAL SERVICE.

It is the view of many senior officers in the Service that the period of depression is now passing and that the prospect is again bright for those who are fitted in physique and disposition for a medical career in India. The offer of permanent commissions on specially favourable terms to a small number of medical men of European descent who were free to sail forthwith to India met last year with the desired response, and the number of commissions granted during the last twelve months is 16.

But the new outlook involves frank acceptance of the Indian reform scheme, the essential of which is increasing participation of Indian-born subjects in the government of the country, although, so long as Europeans are employed in the various departments of the Indian Civil Service, nothing is more certain than that there will and must remain European doctors to attend them. India definitely requires European assistance, not only for the care of the military and civil European population, but for the maintenance in the country of that spirit of modern medicine which has accomplished already such mighty things, and which day by day is spreading in influence and value.

The Government of India issued a communiqué early this year dealing in detail with the reorganisation of the medical services in India. The scheme now sanctioned is based on proposals framed in consultation with local governments. The Indian Medical Service, constituted on the same broad lines as at present, will be retained primarily to meet the needs of the Indian army, and in order to maintain two essential requisites —namely, (1) the necessary minimum war reserve of medical officers, and (2) the provision for European medical attendance on officers and their families. Local governments in India will be required to employ a stated number of I.M.S. officers. It has been calculated that the war reserve to be employed by the civil side should consist of 131 British and 66 Indian officers, the larger proportion of British officers being due to the fact that they cannot be recruited on emergency in India from the ranks of private practitioners. Medical attendance on British personnel, and the requirements of civil administration, for which the Central Government is still responsible, involve the provision of a number of employments termed "residuary," the incumbents of which must be retained permanently in civil employment, so as to ensure the continuance under any circumstances of a skeleton staff to cope with civil requirements. The total number of officers required for civil employment in the I.M.S. is now calculated at 302, allotted as follows: war reserve, 200; residuary posts in provinces, 46; foreign and political departments, 17; gaols, 8; special posts under the Government of India, 14; port health officers at Bombay and Aden, 2; reserve of 5 per cent. as allowance for illness, 15. Of this total 212 will be European and 90 Indian. To provide employment for these 302 officers, 237 posts are required, 59 of which will be available under the Government of India, and 178 (of which 112 must be held by British officers) will be provided in the provinces. The estimate of the medical requirements of European medical attendance is based on data which will change from year to year as the proportion of European to Indian civil officers diminishes; it will therefore be subject to scrutiny and revision. The remaining 66 posts will be open either to Europeans or Indians, while 28 out of 59 appointments under the Government of India will similarly be open to officers of either race.

Rules forming an integral part of the reorganisation scheme have been drawn up to safeguard the varied interests of the Indian army, the provincial governments, and the medical officers themselves (vide THE LANCET, May 19th, 1928, p. 1028).

Thus the social effect of Indianisation should not press hardly on the medical service for the reason that European doctors will be chiefly requisitioned in stations with considerable European communities. In these communities the equipment and organisation of hospitals has been steadily improving and men with professional ambition will find positions which will satisfy their aspirations. On the military side the station hospital system has rendered the position of medical officers more independent by making team-work possible and permitting of specialisation in various departments of medicine and surgery. Lastly, those who join now will have unequalled prospect of advancement in a Service which has been so depleted for 10 or 15 years or more, and the terms of service announced by the Secretary of State for India in 1926 assure conditions of pay, pension, and furlough much superior to those previously offered.

The New Regulations.

Competitive examination remains suspended for the present and admission to the Service is on written application to the India Office. As sound bodily health is a first essential candidates may, if they wish it, undergo a preliminary examination by a Medical Board which meets weekly at the India Office.

Candidates must be under 32 years of age at the time of application, and must possess a qualification registered in Great Britain and Northern Ireland, under the Medical Acts in force at the time of appointment. Arising out of the recommendations of the Lee Commission the Secretary of State for India in Council after consultation with the Government of India has decided that the Indian Medical Service constituted on the same broad lines as in the past shall be retained primarily to meet the needs of the Indian Army. In order to maintain the necessary minimum war reserve of military medical officers, and to provide for European medical attendance for European officers of the Superior Civil Services and their families, local governments will be required to employ a stated number of Indian Medical Service officers. The Government of India will draw on the same Service to meet the requirements of the civil administration for which they are responsible. For the present 237 such posts have been reserved, and including the leave reserve will provide employment for 302 officers. 212 of these officers will be British medical men and 90 Indians. As the proportion of European to Indian civil officers diminishes these figures will be subject to periodical scrutiny, and, if necessary, to revision. It will be a definite condition of service for all future entrants to the Service that they will be liable to serve on either the civil or the military side. All officers are required to perform two years' military duty subsequent to permanent appointment before they can be considered eligible for civil employment. Executive medical officers in both civil and military employment may attend persons unconnected with Government service provided their duty admits of it. On the military side, however, the opportunities for private practice are not great. Service during the war as a medical or combatant officer, or in a position usually filled by an officer, counts towards promotion and pension so long as the rights of officers who have entered by competition are not interfered with.

Rates of Pay.

The monthly rates of pay for European officers of non-Asiatic domicile in the Service are as tabulated below. The rupee, it may be remembered, has now been definitely stabilised at 1*s.* 6*d.*

Rank and service in rank.	Basic pay.	Overseas pay.	Year of total service.
	Rs.	Rs.	
Lieut.	500	150	First
		150	Second
		150	Third
Captain :—			
1. During first three years' service as Captain.	650	150	Fourth
		£15	Fifth
		£15	Sixth
2. With more than three and less than six years' service as Captain.	750	£25	Seventh
		£25	Eighth
		£25	Ninth
3. With more than six years' service as Captain.	850	£25	Tenth
		£25	Eleventh
		£30	Twelfth
Major :—			
1. During first three years' service as Major	950	£30	Thirteenth and over.
2. With more than three and less than six years' service as Major	1100		
3. With more than six years' service as Major.	1250		
Lieut.-Colonel :—			
1. Until completion of 23 years' total service	1500		
2. During twenty-fourth and twenty-fifth years' total service	1600		
3. After completion of 25 years' total service	1700		
4. When selected for increased pay ..	1850		

Note.—Until the completion of 23 years' total service basic pay is regulated according to rank and service in rank (column 1) which, owing to the system of accelerated promotion, may be in advance of the time-scale of promotion. Overseas pay is regulated solely with reference to length of total service (column 4). In addition to the above rates various allowances are admissible for a large number of special appointments on both the military and the civil side which may be held by members of the I.M.S. Special high rates of pay are also attached to the numerous administrative appointments open to officers in both branches of the Service. The appointment of Director-General, I.M.S., which is held by an I.M.S. officer, carries pay of Rs.3500 per mensem. The appointment of Director of Medical Services in India, carrying pay at Rs.3200 per mensem, may also be held by an officer of the Indian Medical Service.

Initial rates of pay are based on the assumption that the majority of newly appointed officers will be bachelors. An officer, when junior, is liable to more frequent changes of station than later on in his service, and he may therefore be put to considerable expense for transfers if he has a family. Officers who are married before joining may find difficulty in living within their pay during the first few years of their service. Officers in military employment, when in command or second-in-command of the larger station hospitals, receive special allowances. On the civil side there are public health, bacteriological, research, and professorial appointments carrying special enhanced rates. Officers on appointment receive an outfit allowance of £50.

Pensions and Allowances.

The rates of pensions are as shown in the table below.

Service.	Rates per annum.	Service.	Rates per annum.
After 17 years ..	£400	After 23 years ..	£620
,, 18 ,, ..	430	,, 24 ,, ..	660
,, 19 ,, ..	460	,, 25 ,, ..	700
,, 20 ,, ..	500	,, 26 ,, ..	750
,, 21 ,, ..	540	,, 27 ,, ..	800
,, 22 ,, ..	580		

Note.—The above rates are subject to revision triennially upwards or downwards, to an extent not exceeding 20 per cent. in all, on account of a rise or fall in the cost of living, as compared with the year 1919. A deduction of 4½ per cent. on this account has already been made. Nevertheless the full pension of a lieutenant-colonel cannot be cut below the maximum of £700 under the old rules in the case of officers who entered the service before July 1st, 1920.

There are additional pensions not subject to the above reduction ranging from £65 to £350 per annum for officers who have held high administrative appointments as colonels or major-generals.

Officers on appointment are provided with free passage to India, normally by transport. The wives and families of officers who are married prior to the date of the officers' embarkation on first appointment will also be given free passage to India. Officers are granted a certain number of return passages home at Government expense during their career. There are special allowances for officers whilst on study leave.

Further particulars can be obtained on application to the Secretary, Military Department, India Office, Whitehall, London, S.W. 1. Letters should be marked "Recruitment for I.M.S."

ROYAL AIR FORCE MEDICAL SERVICE.

THE Air Council attach great importance to attracting into the Service the best type of medical man, since on the capacity of the Medical Service depends in a peculiar degree the safety and efficiency of the Air Force. The duties of a medical officer in the Air Force include not only the prevention and treatment of those ordinary diseases to which the personnel of any fighting service are liable, but the special study of the mental and physical stresses imposed on the airman in diverse circumstances and climates—a new branch of medicine which still provides considerable scope for research.

As promotion to the higher ranks of the Service is by selection from officers who are eligible by reason of length of service, and as a certain proportion of the higher ranks will be reserved for purely scientific as opposed to administrative appointments, it will be seen that there are excellent prospects for the young medical officer who exhibits ability and energy in scientific research, as well as for those who develop talents for administration.

The work to be done, therefore, has a high professional interest which, combined with good rates of pay and allowances, offers a career for medical men which should prove both attractive and interesting. The life is one which is certain to appeal to the man of wide outlook who desires opportunities for travel, sport, and games, and can find interest and enjoyment in aviation.

His duties will, as a matter of course, give him flying experience as a passenger, which is necessary for the proper study of the medical problems of aviation and for gaining first-hand knowledge of the conditions under which his comrades serve.

The establishment will consist partly of permanent and partly of short-service officers.

An officer will on first entry be granted a short-service commission for a period of three years on the active list (which may be extended to five years at the discretion of the Air Council if the officer so wishes on the recommendation of the Director of Medical Services) and of four years in the Reserve of Air Force Officers. Selections for permanent commissions will be made from officers holding short-service commissions, and those who are not selected will be transferred to the Reserve at the expiration of their period of service on the active list.

For those entrants who desire it the prospect of obtaining a permanent commission is approximately an even one. Experience has so far shown that the officers selected have included the great majority of those desirous of, and suitable for, retention in the Service; owing to the fact that the short-service commission with its gratuity after three or five years is in itself an attraction to many entrants who desire to enlarge their experience and outlook from the point of view of subsequently entering private practice, or who, on entry, have not made up their minds to the adoption of a permanent career in the Service and subsequently find that they would prefer to return to civil life.

ROYAL AIR FORCE MEDICAL BRANCH: RATES OF PAY AND ALLOWANCES.

Rank.	Pay.*									Cash allowances at home rates in lieu of quarters, rations, and servant, if not available in kind (per annum).†						Pay plus allowances per annum.					
	Daily rates.						Per annum (current rate).			Married.			Unmarried.			Married.			Unmarried.		
	Standard.			Current.																	
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Flying Officer	1	4	0	1	2	6	410	12	6	156	12	11	141	8	9	567	5	5	552	1	3
Flight Lieutenant— ..	1	6	0	1	4	6	447	2	6	206	16	8	159	13	9	653	19	2	606	16	3
After 2 years as such..	1	8	0	1	6	4	480	11	8	206	16	8	159	13	9	687	8	4	640	5	5
After 4 years as such..	1	10	0	1	8	2	514	0	10	206	16	8	159	13	9	720	17	6	673	14	7
Squadron Leader— ..	1	14	0	1	12	0	584	0	0	206	16	8	171	17	1	790	16	8	755	17	1
After 2 years as such..	1	18	0	1	15	8	650	18	4	206	16	8	171	17	1	857	15	0	822	15	5
After 4 years as such..	2	0	0	1	17	8	687	8	4	206	16	8	171	17	1	894	5	0	859	5	5
After 6 years as such..	2	4	0	2	1	4	754	6	8	206	16	8	171	17	1	961	3	4	926	3	9
After 8 years as such..	2	8	0	2	5	2	824	5	10	206	16	8	171	17	1	1031	2	6	996	2	11
After 10 years as such..	2	10	0	2	7	0	857	15	0	206	16	8	171	17	1	1064	11	8	1029	12	1
Wing Commander— ..	2	15	0	2	11	8	942	18	4	206	16	8	184	0	5	1149	15	0	1126	18	9
After 2 years as such..	2	17	0	2	13	6	976	7	6	206	16	8	184	0	5	1183	4	2	1160	7	11
After 4 years as such..	3	3	0	2	19	2	1079	15	10	206	16	8	184	0	5	1286	12	6	1263	16	3
Group Captain.	3	10	0	3	5	10	1201	9	2	282	17	6	255	10	0	1484	6	8	1456	19	2
Air Commodore	4	0	0	3	15	2	1371	15	10	337	12	6	310	5	0	1709	8	4	1682	0	10
Air Vice-Marshal.. ..	5	0	0	4	14	0	1715	10	0	406	1	3	375	12	11	2121	11	3	2091	2	11

* Except for periods of service under Indian administration. For such periods officers receive pay and allowances at rates and subject to conditions authorised from time to time by the Government of India.

† These allowances are issued only when accommodation, fuel and light, rations, and personal attendance are not available in kind. Normally, provision in kind is available for junior officers. "Married" rates of allowances are payable only to married officers who have reached the age of 30 or the rank of Squadron Leader. A colonial allowance is granted in certain commands abroad. The rates and general scheme of allowances are liable to revision as circumstances may require.

For certain purposes medical officers may be allowed to count as service their time spent in resident appointments in civil hospitals under certain well-defined and generous conditions.

Officers who have been selected for permanent commissions may be permitted to attend for a period not exceeding nine months a post-graduate course in general medicine and surgery, tropical and preventive medicine, and other special subjects. Such permission may be granted at any time when the exigencies of the Service permit during the first 10 years of service, and when attending these courses officers will receive full pay and allowances.

New entrants into the Royal Air Force Medical Service will be commissioned as Flying Officers (Medical) and will be eligible for promotion to the rank of Flight Lieutenant (Medical) after two years' service. Officers selected for permanent commissions will normally be promoted to the rank of Squadron Leader after ten years' total service. Accelerated promotion may be granted in a limited number of cases to officers who show exceptional ability after the completion of eight years' service. Promotion within establishment to the rank of Wing Commander will be by selection at any period after 16 years' total service, and that of Group Captain by selection at any period after 22 years' service.

Certain posts in these ranks are reserved for officers fully employed in professional work, such as surgery, pathology, ophthalmology, &c., numbering at present six in all. The number of these posts will be limited only by the needs of the Service and by the necessity of observing a similar proportion between the number of reserved posts and the officers from whom they can be filled, as exists between the total number of higher ranks and the remainder of the medical service. Selections for these reserved posts will be made only from officers professionally qualified to hold them. Officers filling the reserved posts will be eligible for selection to the administrative appointments of their rank, and to the highest administrative appointments.

There will be no competitive examination on entry; candidates must be under 28 years of age, be British subjects, the sons of British subjects, and of pure European descent, be nominated by the dean of a recognised medical school or teaching hospital, and will be interviewed personally by the Director of Medical Services, Royal Air Force, before acceptance. Each candidate must produce:—

1. Birth certificate. 2. Medical registration certificate. 3. A declaration containing the following information: (*a*) Age and place of birth. (*b*) That he is a British subject, the son of British subjects, and of pure European descent. (*c*) That he is ready to engage for general service at home or abroad as required. (*d*) The qualifications he is possessed of, and what medical or other appointments he has held (if any). (*e*) That he is willing to fly as a passenger whenever called upon to do so.

Each candidate will be required, before acceptance, to pass a medical examination to ensure that he labours under no constitutional or mental disease or diseases or weakness, nor any imperfection or disability which may interfere with the efficient discharge of the duties of a medical officer in any climate, in peace or war.

On appointment entrants will undergo an initial course of eight weeks, during which they will be given instruction in the special medical aspects of aviation, the organisation and administration of the Royal Air Force, and the general and special duties to be performed by officers in the Medical Branch.

In order to avoid the necessity for further examinations the position of entrants in order of seniority in the Air Force List will be determined at the end of the initial course by a system of marking and reports on the actual work done during their instruction.

Uniform and Equipment.

Medical officers are required to provide themselves with the uniform, service dress, and mess dress of their rank and with the distinguishing badges of the Royal Air Force Medical Branch. The provision of full dress is entirely optional at present. An allowance of £50 towards the cost of uniform is made on joining to candidates who have not had previous commissioned service in H.M. Forces.

Emoluments.

The emoluments of medical officers of the Royal Air Force are given in outline above. The standard rates of pay and retired pay were drawn up on the basis of the high cost of living in 1919, and 20 per cent. of each of the standard rates is detachable and subject to alteration either upwards or downwards as the cost of living rises or falls. Under this provision the current rates now in force represent a reduction of approximately 6 per cent. on the standard rates. The next revision will take effect from July 1st, 1930, and subsequent revisions will be made at intervals of three years.

RETIRED PAY.

The minimum period of service qualifying for retirement on retired pay is 20 years. Standard rates of retired pay are as follows:—

Air Officers.

Air Vice-Marshal ..	.. £790 to £1010 per annum.
Air Commodore ..	.. £650 ,, £950 ,, ,,

The maximum standard rates of retired pay and the compulsory retiring ages for the several ranks are:—

Rank.	Yearly rate of retired pay.	Compulsory retiring age.
	£	
Air Vice-Marshal ..	1010	60
Air Commodore ..	950	57
Group Captain.. ..	900	55
Wing Commander ..	600	51
Squadron Leader ..	500	48

Retired Pay of Officers below Air Rank.

Age on retire-ment.	Standard yearly rate of retired pay.	Years of service.	Addition for each extra year of service.*	Deduction for each deficient year of service.*
	£		£	£
40	300	17	15	15
41	337	17	15	15
42	375	18	15	15
43	412	18	15	15
44	450	19	15	15
45	487	19	15	15
46	525	20	15	15
47	562	20	15	15
48	600	21	15	15
49	637	21	15	15
50	675	22	15	15
51	697	22	22	15
52	720	23	22	15
53	742	23	22	15
54	765	24	22	15
55	790	24	22	15

* Limited to five years.

Gratuities.—A permanent officer allowed to retire before having qualified for retired pay may be granted a gratuity provided he has not less than ten years' commissioned service, namely:—

£1500 if he has 10 but less than 15 years' commissioned service.
£2500 ,, 15 or more than 15 ,, ,, ,,

Short-service officers will be eligible on passing to the Reserve for gratuities on the following scale: £100 for each of the first two complete years of service, £150 for each of the third and fourth complete years, and £200 for the fifth complete year; that is:—

For three years' service on the active list .. £350
For five ,, ,, ,, ,, .. £700

These gratuities will not be payable to officers granted permanent commissions, but their service on a short-service commission will count towards retired pay.

COLONIAL MEDICAL SERVICE.

IN the self-governing Dominions (Canada, Australia, New Zealand, the Union of South Africa, and Newfoundland), and territories under their control, such as Papua and the Cook Islands and in the self-governing colony of Southern Rhodesia, medical appointments are made concerning which information can be obtained from the High Commissioners or Agents-General in London; in North Borneo application should be made to the British North Borneo Company, 17, St. Helen's-place, E.C., for appointments; and those in Sarawak are in the hands of H.H. the Rajah. Much valuable information will be found in the "Professional Handbook," Part II., issued by the Oversea Settlement Office, Caxton House, Tothill-street, London, S.W. 1, price 9*d*.

As a general rule, each Colony or Protectorate has its own public service distinct from that of every other; and it is usually only the higher officers who are transferred by the Secretary of State from one Colony to another. There are three exceptions to this rule: (*a*) The West African Medical Staff, which serves Nigeria, the Gold Coast, Sierra Leone, and the Gambia, is one service. (*b*) The East African Medical Service, which serves Kenya, Uganda, Zanzibar, Nyasaland, Somaliland, and the Tanganyika Territory is one service. (*c*) In practice the medical services of the Straits Settlements and the Malay States may be regarded as one, as the officers may be and frequently are transferred from the Colony to the States or vice versa; the two services are now called the Malayan Medical Service.

The Colonies, Protectorates, and Mandated Territories to which medical officers are appointed by the Secretary of State for the Colonies are (*a*) the West African—viz., Nigeria, the Gold Coast, Sierra Leone, and the Gambia, with the Mandated Territories of Togoland and the Cameroons; (*b*) the East African—viz., the Kenya Colony and Protectorate, Uganda, Nyasaland, Somaliland, and Zanzibar Protectorates, the Tanganyika Territory, and Northern Rhodesia; (*c*) the Eastern—viz., Ceylon, the Straits Settlements and Malay States, Hong-Kong, Mauritius, and Seychelles; (*d*) the West Indian—viz., Jamaica, Trinidad, the Windward Islands, the Leeward Islands, Barbados, and the Bahamas; (*e*) Fiji and the Western Pacific, Cyprus, Gibraltar, St. Helena, British Guiana, British Honduras, Bermuda, and the Falkland Islands; and (*f*) Palestine.

In Ceylon, Mauritius, Jamaica, Barbados, the Bahamas, and Bermuda vacancies are practically always filled locally by the appointment of qualified native candidates, or—in the case of some of the higher posts—by transfer from other Colonies. In the Bechuanaland Protectorate, Basutoland, and Swaziland appointments are usually filled locally. Appointments in Malta are all filled locally. In addition, certain medical appointments in the service of the Government of Iraq are filled with the concurrence, and normally upon the recommendation, of the Secretary of State. Vacancies occur most regularly and frequently in the West African Medical Staff, the East African Medical Service, and the Straits Settlements and Malay States.

All applicants for medical appointments in the gift of the Secretary of State for the Colonies should be under 35 years of age, and must be doubly qualified; preference will be given to those who have held hospital appointments as house physicians and house surgeons; testimonials to character and professional competence will be required, and every officer before being definitely appointed will be medically examined by one of the consulting physicians of the Colonial Office: Sir William Prout, C.M.G., O.B.E., and Dr. A. E. Horn, C.M.G., 104, Harley-street, London, W. 1; Major-General J. J. Gerrard, C.B., C.M.G., the Royal Hospital, Kingsbridge, Dublin; Dr. Foster Coates, 22, College-gardens, Belfast; and Lieut.-Colonel Glen Liston, C.I.E., I.M.S., 33, Comely Bank, Edinburgh, and Dr. C. V. Le Fanu, 33, Rodney-street, Liverpool. Applications for such appointments must be addressed to the Private Secretary (Appointments), Colonial Office, 2, Richmond-terrace, Whitehall, S.W. 1.

EAST AFRICAN MEDICAL SERVICE.

The Medical staffs of the Kenya Colony and Protectorate, the Uganda, Nyasaland, Somaliland, and Zanzibar Protectorates, and the Tanganyika Territory form one service, the members of which are liable to be posted or transferred to any of the Dependencies as the exigencies of the service may require. The preferences of individual officers are, however, taken into consideration as far as possible.

Selected candidates are appointed as medical officers on probation in the first instance for two years, at the end of which period their appointments are made permanent if their service has been satisfactory. Unless the Secretary of State directs to the contrary, they are required to attend a course of instruction at the London or Liverpool School of Tropical Medicine or the University of Edinburgh before taking up their appointments. If such a course is not taken before proceeding to East Africa, they are required to take it during their first leave of absence. Medical officers (but not sanitation officers) are permitted to take private practice at some stations on the understanding that they give precedence to their official duties. It must be understood that additions to their income from this source are not likely to be substantial, and that the privilege is liable to withdrawal at any time.

Officers are provided with quarters free of rent or the Government may provide temporary accommodation, or an allowance in lieu of quarters may be paid. The salary of a medical or sanitation officer is £600 per annum, rising by annual increment of £30 to £810, and thence by increments of £40 to £920, subject to an efficiency bar at £840. Senior medical officers and senior sanitation officers are paid on the scale £1000 by annual increments of £50 to £1100. Officers who possess the Diploma in Public Health on entering, or who acquire it while in the Service, receive two special increments in the scale.

Officers of the East African Medical Service are permitted to retire with gratuity, if they wish, instead of waiting to retire on pension as follows: (*a*) After nine years' service, of which at least six must have been spent in East Africa, £1000; (*b*) after 12 years' service, of which at least eight must have been spent in East Africa, £1250. If an officer elects to retire with gratuity he thereby forgoes all claim to pension.

The grades and salaries (apart from ordinary medical and sanitation officers) in the medical departments are as follows:—

Kenya.—Director of Medical and Sanitary Services, £1500; Deputy Director of Medical Service, £1200: Deputy Director of Sanitary Service, £1200; Deputy Director of Laboratory Service, £1200.

Uganda.—As Kenya.

Tanganyika Territory.—As Kenya.

Nyasaland.—Director of Medical and Sanitary Services, £1200; Medical Entomologist, £1000–£50–£1100.

Zanzibar.—Director of Medical and Sanitary Services, £1100; Deputy Director of Sanitary Service, £1200: Resident Surgical Officer, £1000–£50–£1100.

Somaliland.—Principal Medical Officer, £1000–£50–£1100.

There are also the following posts:— Resident Surgical Officers (Kenya and Uganda), £1200; Specialist Officer, Sleeping Sickness (Uganda), £1150; Medical Superintendent and Principal of Medical School, Mulago Hospital (Uganda), £1150; Sleeping Sickness Officer (Tanganyika Territory), £1000–£50–£1100; Senior Bacteriologists (Kenya and Uganda), £1000–£50–£1100.

Sanitation officers are selected from the ranks of medical officers as occasion arises.

ASIA.

Straits Settlements and Federated Malay States.—European medical officers are appointed on the following scale of salaries: $500 per mensem, rising to $550 per mensem during three years' probation; then, if they are placed on the pensionable establishment, rising to $575 per mensem, and thence by annual increments of $25 per mensem to $800 per mensem, with a strict efficiency bar at $600 per mensem. Officers possessing the D.P.H. receive an additional allowance (non-pensionable) of $100 per mensem.

Above the concluding figure of $800 *per mensem* there are certain higher appointments, as follows: *Principal Civil Medical Officer, Straits Settlements*, and Principal Medical Officer, Federated Malay States, $1200 *per mensem*; *Director, Institute for Medical* Research, Federated Malay States, Chief Health Officer, Federated Malay States, and Principal Medical College, Straits Settlements, $1100 per mensem; Senior Surgeon, Singapore, $1050 per mensem; 3 Chief Surgeons, Federated Malay States, $1000 per mensem; Medical Officer and Ophthalmic Surgeon, $1000 per mensem; 6 posts at $1050 per mensem; and 17 posts at $850 per mensem, rising annually by $30 to $1000 per mensem. There are also 14 medical appointments, including several senior posts, in the Unfederated Malay States.

The following temporary allowances are at present paid to all officers recruited from Europe in the Government Services of the Straits Settlements and Federated Malay States: unmarried officers, 10 per cent. of salary; married officers, 20 per cent. of salary. Private practice by Government medical officers is not allowed, but consultation work with another practitioner is permitted. Information about general conditions in Malaya is obtainable from the Malay States Information Agency, 57, Charing Cross, S.W. 1.

Seychelles.—The chief medical officer receives Rs.7000 per annum. There are four assistant Government medical officers, two receiving Rs.6500, the others Rs.3000 per annum.

Hong-Kong.—The present establishment of the medical department is: director of medical and sanitary services, £1200–£50–£1450; deputy director, £1125–£25–£1200: senior medical officer, £1025–£25–£1100; three medical officers of health, £740–£30–£1040; health officer of the port. and second health officer of the port, £740–£30–£1040; five medical officers, £600–£30–£1020; bacteriologist, £800–£1100; assistant bacteriologist, £740–£30–£1040; radiologist. £740–£30–£1040; analyst, £625–£25–£900; assistant analyst, £400–£25–£700. A temporary allowance on a scale varying with the sterling exchange value of the dollar is at present payable. Salaries are converted locally at the rate of 2*s.* = $1. Free quarters are not provided, but in certain instances a rent allowance is paid by the Government.

AMERICA.

British Guiana.—There are the following posts in the medical service of the Colony: one surgeon-general, £1000–£1200 per annum, with consulting practice: one medical officer of health, £900; ophthalmologist, £700; one bacteriologist and pathologist, £700; 37 medical officers at £500–£25–£700. Most of the senior posts in institutions carry duty allowances (varying from £50 to £300 per annum) and quarters.

Trinidad and Tobago.—In Trinidad and Tobago there are about 40 appointments. Government medical officers receive salary at the rate of £100 per annum, rising by annual increments of £25 to £600. An officer appointed to a district receives, in addition to his salary, a travelling allowance varying from £100 per annum in a normal district to £150 per annum, and is allowed private practice, the value of which is estimated at from £50 to £800 per annum. Officers employed in institution work receive a duty allowance varying from £50 to £300. Medical officers having completed 10 years' resident service are pensionable at the age of 55.

Windward Islands (Grenada, St. Lucia, St. Vincent). There are over 25 appointments. The chief medical officer, Grenada, receives £750. The chief medical officer, St. Lucia, receives £600–£700 plus forage and subsistence allowances; the post is pensionable, but private practice is not allowed except as a consultant. Most of the remaining appointments are district appointments with the right to private practice attached; the salaries paid by Government are on the scale from £400–£500, except in St. Vincent, where the maximum is £450. The Governor has the power to transfer a medical officer from one island to another. Appointments are pensionable.

Leeward Islands (Antigua, St. Christopher and Nevis, Dominica, Montserrat, Virgin Islands).—The appointments are similar in number and character to those in the Windward Islands, and are pensionable. An officer when first sent out is not appointed to a particular island but to the service of the Leeward Islands, with a salary of £350, and is later appointed to a definite district at a salary varying from £312 to £400–£25–£450, and the Governor decides as to the district which is to be allotted to him, according to station. He is liable to be transferred at the Governor's discretion to any medical district in the Leeward Islands. The medical officers, except in St. Christopher and Nevis, receive fees for successful vaccinations, post-mortem examinations, evidence at courts of justice, certificates of lunacy, and, in the larger islands, for burial certificates. They are also, as a rule, allowed private practice. The chief medical officer, St. Christopher and Nevis, receives £700–£25–£750, but is not allowed private practice, except as a consultant.

British Honduras.—There are seven medical appointments (besides the post of principal medical officer) at a salary of $2430 per annum with increments of $120 to $3150. Unless they already possess a diploma of public health, medical officers are liable to be required, before they join the colony, to undergo a course of instruction at a laboratory of public health or analogous institution. The value of the dollar is the same as that of the United States dollar.

OTHER OVERSEAS APPOINTMENTS.

Fiji.—The Chief Medical Officer receives £1000–£50–£1100, with free quarters, unfurnished; the Medical Superintendent, Colonial War Memorial Hospital, £800–£50–£1000, with £40 car allowance and free quarters; the Medical Superintendent, Leper Asylum, £750–£50–£950, with completely furnished quarters and one servant; the Medical Officer of Health, £750–£25–£900, no quarters provided. There are 14 District Medical Officers who receive £500–£25–£725, with partly furnished quarters or £50 house allowance (at the option of the Government) and duty allowance of £50 per annum in districts where no private practice exists. In certain districts house allowances or car allowances are granted. In others a medical officer is provided with a launch or boat. District Medical Officers are allowed private practice on the understanding that their official duties are not neglected. In five districts the Medical Officer is also District Commissioner and receives an additional allowance of from £175 to £275 and free partly-furnished quarters. In most districts there is private practice, the value of which has been estimated at from £100 to £600 a year.

Western Pacific High Commission.—The staff in the British Solomon Islands Protectorate consists of a Senior Medical Officer (£650–£750), two District Medical Officers (£550–£650), and one Travelling Medical Officer (£550–£650). Partly-furnished quarters are provided and a local allowance of £50 per annum is paid to the Senior Medical Officer and the District Medical Officers. A local allowance of £50, consolidated travelling and subsistence allowance £200, and partly-furnished quarters are provided for the Travelling Medical Officer.

In the Gilbert and Ellice Islands Colony there is a Senior Medical Officer (£650–£750), with partly-furnished quarters, and one Medical Officer (£600–£25–£650), with partly-furnished quarters or house allowance. There is hardly any private practice in the British Solomon Islands Protectorate or the Gilbert and Ellice Islands Colony.

Cyprus.—There is a chief medical officer paid at the rate of £750, rising by annual increments of £25 to £850, and three district medical officers paid at the rate of £500 a year, rising by annual increments of £20 to £600 a year, all enjoying private practice (except the chief medical officer and one of the district medical officers, who are allowed consulting practice only). There is also a post of consulting surgeon, £400–£20–£600 a year, with consulting practice. There is also a medical officer of health on £600, rising by £20 increments to £750 without private practice, and a specialist in venereal diseases with a salary of £700 a year and consulting practice; these are the only medical appointments open to British candidates.

Gibraltar.—There is a surgeon of the Colonial Hospital receiving £730, and private practice. There are also two assistant surgeons with a salary of £600 for 3 years and thereafter £650–£25–£700 per annum, who are allowed private consulting practice only. Free quarters, unfurnished, are provided for all three officers.

St. Helena.—The colonial surgeon at present receives £550 per annum, fees estimated at about £27 a year, and £30 horse allowance. The assistant colonial surgeon at present receives £500 a year and £30 horse allowance. Private practice is allowed, and such practice, together with the duties of non-Government appointments, is divided between the colonial surgeon and the assistant colonial surgeon in a proportion approved by the Governor. The value of private practice and appointments is estimated at about £536 a year.

Falkland Islands.—There are two appointments. The colonial surgeon is paid at the rate of £600 per annum, with free furnished quarters. The assistant colonial surgeon is paid at the rate of £500 per annum, with an allowance of £50 per annum in lieu of quarters. Private practice is shared between the colonial surgeon and the assistant colonial surgeon. The office of colonial surgeon is pensionable. The medical service of this colony is now under review.

Palestine.[1]—The grades and salaries of higher appointments in the Department of Health are: Director, £P.1200, plus £P.200 expatriation allowance. Deputy Director, £P.900–50–£P.1100, plus £P.150 expatriation allowance. Assistant Director (Laboratories), Specialist Surgeon,[2] and five Senior Medical Officers, £P.750–25–950, plus £P.100 expatriation allowance. One Senior Medical Officer and Government Analyst, £P.550–25–750, plus £P.100 expatriation allowance. The remainder of the staff is recruited locally. A temporary and variable cost-of-living allowance is at present payable in addition to the salaries stated above.

Iraq.—The grades and salaries of the principal appointments in the Department of Health are: Rs.1800–100–2800 a Inspector-General of Health. month; Health Specialists, Directors of Hospitals and Institutes. Chief Medical Officers in Mosul and Kirkuk. Medical Officers of Health in Baghdad and Basra, Rs.1500–75–1800–100–2300 a month; Medical Officers. Rs.1200–75–1800 a month. Posts in the service of the Government of Iraq are not pensionable. Every officer (unless serving on a 3 years' contract) is required to contribute one-twelfth of his pay to a provident fund, to which the Government makes a contribution equal to one-sixth of his pay.

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[1] £P.1 = £1 sterling.

[2] A certain amount of private practice is allowed.

LEAVE AND PENSIONS.

Leave and Passages.—Leave of absence in East Africa. The normal tour of service is 20 to 30 months (less in Somaliland) after which leave is granted with full salary for 2½ to 3½ days, according to the districts in which the officer has served, for each month of service, plus the period of the voyage to England. If the officer is returning to East Africa for further service, he receives a further similar amount of leave, plus the period of the voyage to East Africa. Extensions of leave with full salary are given in case of sickness or in the case of officers attending approved courses of instruction. In addition to the above, local leave may be granted up to 14 days a year. Officers serving in Northern Rhodesia are allowed four (or two) days' leave in respect of each month of service. Free first-class passages are provided for the officer on first appointment and on leave, and in certain cases assistance towards family passages is given.

In the Malay Peninsula two months' leave of absence with full salary may be granted in respect of each year's service, and this leave may be accumulated up to a maximum of eight months. Additional leave on half-pay may be granted on special grounds. Officers are provided with free passages on first appointment for themselves and their families (i.e., wife and children up to five persons, inclusive of the officer). Under temporary regulations at present in force, free return passages on leave to all officers (and their wives and their children under the age of 10) irrespective of salary.

In other Colonies outside Tropical Africa, subject to the necessities of the service, leave of absence on half salary may be granted after a period of three years' resident service without any special grounds. It may be given before the expiration of that period in case of serious indisposition, or of urgent private affairs. In the absence of special grounds, the leave must not exceed one-sixth of the officer's resident service; on special grounds it may exceed that period by six months. In addition to the above, vacation leave on full pay may be granted, if no inconvenience or expense is caused thereby, not exceeding three months[3] in any two years. British Guiana, Jamaica, and Trinidad officers are allowed to accumulate full-pay leave at the rate of six weeks for each year's service up to six months, exclusive of the period of the voyages to and fro, and no leave of absence may (except in very special circumstances) exceed six months in all unless the officer has served for five years or more without leave, in which case two months on half-pay may be taken in addition to six months' full-pay leave.

On first appointment an officer will, except in the case of a few Colonies possessing Representative Assemblies, be provided by the Crown Agents for the Colonies with free passages to the Colony for himself and his wife and children, if any, not exceeding four persons besides himself. The officer so appointed will be required to execute an agreement binding him to repay the cost of the passage or passages so obtained in the event of his leaving the Government service within three years. An officer taking leave out of the Colony has in most cases to provide his own passages.

Pensions.—East Africa.—Officers on the pensionable establishment may retire (or be retired by the Government) on attaining the age of 50 years; but they may be retained in the service, with their own consent, for such further period as the Government may recommend. Earlier retirement in the event of ill-health is also provided for. Pension is computed at one-four hundred and eightieth of pensionable emoluments—i.e., salary and value of free quarters[4] in respect of each month's pensionable service—at the time of retirement, subject to an average of emoluments for the last three years before retirement instead of the actual emoluments at the time of retirement being taken as the basis for calculation in certain circumstances.

Other Colonies.—In most of the other Colonies an officer holding a pensionable appointment may be allowed in the case of ill-health to retire on a pension after ten full years' resident service; otherwise he must have attained the age of 55. For ten full years' resident service fifteen-sixtieths of the average annual salary of the retiring officer's fixed appointments for three years prior to retirement may be awarded, to which one-sixtieth may be added for each additional year's service; but no addition will be made in respect of any service beyond 35 years. For pension purposes absence on vacation leave counts as full service, and leave on half-pay as half service. In a few cases the retiring age is 60 and the pension after ten years' service is ten-sixtieths instead of fifteen. In the Straits Settlements and Malay States, an officer may, with the consent of Government, retire at age 50. Pensions are calculated on a basis of length of service in months instead of years.

WEST AFRICAN MEDICAL STAFF.

Applicants for appointment as medical officers or medical officers of health in the West African Medical Staff (the higher grades will usually be filled by promotion from the lower) must be British subjects of European parentage and between 23 and 35 years of age; preference is given to candidates who are over 25 years of age. Applicants must possess a complete double qualification, and must be on the Medical Register. Passages for wives and children are not provided by the Government; and houses for the wives of junior medical officers are rarely available. Officers are not usually allowed to take their wives and young children out with them until they have acquired experience of the local conditions and have obtained the sanction of the Governor. When an officer has obtained permission to be accompanied by his wife a grant of one-half the cost of his wife's passage to and from West Africa is made subject to certain conditions.

Candidates whom it is proposed to select for appointment will have to be medically examined by one of the medical advisers of the Colonial Office (or, in the case of those residing in a Colony, by a medical officer appointed by the Colonial Government), and no appointment will be made unless the candidate is declared to be physically fit for service in West Africa. Candidates are allowed to express a preference for any particular Colony, and their wishes in this respect will be borne in mind and met as far as possible, but they are liable to be posted in the first instance, or transferred afterwards if necessary to any other West African Colony at the discretion of the Secretary of State. Candidates who wish to be posted to Nigeria will probably find it useful to be able to ride. Transfers from one Colony to another will be made as seldom as possible. Candidates should on no account apply for, or accept, a West African appointment in the expectation of ultimately being transferred.

Those transferred to pensionable Crown appointments elsewhere than in West Africa do not forfeit their claim to pension in respect of their West African service on final retirement, provided that they have been members of the staff for at least 12 months. Every officer selected for appointment is required to have himself revaccinated before proceeding to West Africa, unless one of the medical advisers of the Colonial Office certifies that this is unnecessary.

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[3] Or, in the case of Fiji and the Western Pacific and the Falkland Islands 4½ months in any three years.

[4] The value of free quarters for pension purposes is taken as 15 per cent. of the minimum salary of the grade in which an officer is serving at the time of retirement, subject to a maximum of £150.

Instruction in Tropical Medicine.—Every candidate selected for appointment will, unless the Secretary of State decides otherwise, be *required* to undergo a course of instruction either at the London School of Hygiene and Tropical Medicine, Endsleigh-gardens, N.W. 1, or at the Liverpool School of Tropical Medicine, Liverpool University, or at Edinburgh University. The cost of tuition will be borne by the Government, but candidates must make their own arrangements for board and lodging; an allowance of £25 a month will be paid to them monthly in arrear while they are under instruction. Payment of the allowance will be made subject to the candidate signing an agreement by which he is bound to refund it (1) if he declines to accept an appointment in any of the Colonies for which he may be selected; (2) if he fails to obtain a certificate or diploma; (3) if he relinquishes the Service for any other reason than mental or physical infirmity, or is removed for misconduct, within three years of his arrival in West Africa.

If at the end of the session there exists no vacancy in the Staff to which a candidate can be appointed, he will be placed in a Reserve and granted an allowance at the rate of £200 a year until the occurrence of a vacancy.

Leave of Absence.—European officers in West Africa may be granted vacation leave on full salary not exceeding in all one week's leave in the United Kingdom for every completed calendar month of total residential service in West Africa, plus the time necessarily taken on the journey to the United Kingdom, and, if the officer is returning to West Africa for further service, the time necessarily taken on the journey from the United Kingdom to the Colony. Vacation leave may be granted without any special grounds after 18 consecutive calendar months of residential service in West Africa. An officer will not be required to serve a tour of more than 24 consecutive calendar months' residential service except in special circumstances; and the Governor may grant vacation leave to any officer at any time after he has completed 12 consecutive calendar months' residential service within the above limits, the actual length of each officer's tour will be at the discretion of the Governor. Vacation leave on full salary may also be granted to an officer if he is invalided from West Africa after less than 12 consecutive calendar months' residential service, and sick leave on full salary may be granted for any period not exceeding six calendar months.

Appointments and Salaries.—Medical officers for the West African Colonies and Protectorates—namely, the Gambia, Sierra Leone, the Gold Coast (including Ashanti and the Northern Territories), and Nigeria (Southern and Northern Provinces)—are selected by the Secretary of State for the Colonies, and are on one list for employment and promotion. The grades and emoluments of the Staff are at present as follows:—

The Director of the Medical and Sanitary Service, Nigeria, receives a salary of £1800 a year, with a duty allowance at the rate of £360 a year. The Director of Medical and Sanitary Service in the Gold Coast receives a salary of £1600 a year, with a duty allowance at the rate of £320 a year. The Director of Medical and Sanitary Service in Sierra Leone receives a salary of £1400 a year, with a duty allowance at the rate of £280 a year. The Deputy Director of Medical and Sanitary Service, Nigeria, and the Deputy Director of Sanitary Service, Nigeria, receive salaries of £1500 a year, with duty allowances at the rate of £300 a year. The Deputy Director of Medical and Sanitary Service, Gold Coast, and the Assistant Director of Medical and Sanitary Services, Nigeria, receive salaries of £1400 a year, with duty allowances at the rate of £280 a year. Assistant Directors Medical Service: There are seven appointments on this grade, five in Nigeria, two in the Gold Coast. The salary is at the rate of £1300 a year, with duty allowance at the rate of £260 a year. The Assistant Director of Sanitary Service, Nigeria, the Deputy Director of Sanitary Service in the Gold Coast and the Deputy Director of Sanitary Service in Sierra Leone receive salary at the rate of £1300 a year, with duty allowance at the rate of £260 a year. Specialists: The number of these appointments is not fixed, officers of outstanding professional merit being *eligible* for appointment. The salary is at the rate of £1300 a year, with duty allowance at the rate of £280 a year. After five years' approved service as such, the specialist officer is eligible to receive a salary at the rate of £1400 a year, with duty allowance at the rate of £280 a year. There are at present five officers appointed specialists in Nigeria, three in the Gold Coast, and one in Sierra Leone. Senior Medical Officer: There are twenty appointments of this grade, with salary at the rate of £1000 a year, rising by annual increments of £50 to £1150 a year, and seniority allowance at the rate of £100 a year. The Senior Medical Officer, Gambia, is allowed "staff pay" of £150 a year, in addition to duty allowance, but he is debarred from private practice. Senior Sanitary Officer: *There are nine appointments of this grade, with salary at the rate of £1050* a year, rising by annual increments of £50 to £1200 *a year, and a* duty allowance at the rate of £210 a year. Possession of the *Diploma in Public Health is usually required for appointment to this* grade. Special facilities are granted to study for the diploma during leave. *Medical Officers of Health*: There are at present 24 appointments of this *grade. The* salary scale is the same as that of Medical Officers, except that Medical Officers of Health are granted an initial *salary at the* rate of £800 a year, together with seniority *allowance at the rate of* £72 *a year and staff pay* at the rate of £150 a year, half of which is payable during leave. After three years' service on the *maximum of* the scale, viz., £960 a year, and on undergoing an approved *course of* study, Medical Officers of Health are eligible, if unpromoted, *subject to the recommendation of the Governor, to be placed* on the scale £1000 a year rising by annual *increments of* £50 to £1150 a year, together with seniority allowance at the rate of £100 a year and staff pay as before. The holders of these appointments are not allowed private practice. *Candidates selected for service as Medical Officers of Health* must obtain the Diploma in Tropical Medicine and Hygiene of Cambridge, London, or Liverpool as a condition of appointment, or must be in possession of the Diploma in Public Health. They are appointed subject to the condition that, *if after a period of service in West Africa they are considered* unsuitable to serve in that capacity, they may be called upon to transfer to the medical side. In such cases the officers are given the rate of salary which they would have reached if they had been appointed to be Medical Officers instead of Medical Officers of Health in the first instance. Medical Officer: The salary attached to this grade is at the rate of £660 a year, rising by annual increments of £30 to £720 a year. Then, if confirmed in the appointment, £720 a year, rising by annual increments of £40 to £960, with seniority allowance at *the rate of £72 a year. Before passing £800, medical officers are required to take a special course of study for three months. If they obtain satisfactory certificates at the end of the course they draw their further increments up to £960 a year.*

A medical officer who has served for three years on the maximum salary of this scale (£960) without obtaining promotion is eligible, if recommended by the Governor, to be placed on the scale £1000–£50–£1150, with £100 seniority allowance (as for Senior Medical Officers).

Special Appointments.—The Director of the Medical Research Institute, Lagos, and the Director of the Medical Research Institute, Accra, receive a salary of £1300 a year, with a duty allowance of £260 a year, rising after five years' approved service to a salary at the rate of £1400 a year and duty allowance at the rate of £280 *a* year. There are a number of appointments for pathologists and bacteriologists in Nigeria and the Gold Coast. The salary and other conditions attached to these posts are similar to those of Medical Officers of Health. Duty allowances, seniority allowance, and staff pay are not pensionable emoluments.

Increments.—Increments to salaries are payable only when the service of *an officer* during the period of employment qualifying for increment is *approved.*

Payment of Salaries.—Information as to the payment of officers' salaries or of monthly remittances to persons in England may be obtained from the Crown Agents for the Colonies, 4, Millbank, S.W. 1. All allowances are paid locally.

All officers of the staff, except *directors*, deputy directors, assistant directors, senior sanitary officers, *medical officers of health*, research officers, and a *few other officers holding* special appointments, *are at present allowed to* take private practice, provided that it does not interfere with the faithful and efficient performance of their official duties, but it is within the power of the Governor to withdraw or suspend the privilege in such places and for such periods as he may consider desirable. Private practice does not exist at many stations, and no guarantee can be given that an officer will be posted to a station in which he will be able to practise privately. As a general rule, and subject to the exigencies of the service, stations where there is private practice are allocated to senior members of the Staff.

Pensions and Gratuities.—Pensions and gratuities on retirement are granted in accordance with the law and regulations of each individual Colony.

Fuller information can be obtained from the Private Secretary, Colonial Office, 2, Richmond-terrace, London, S.W.1.

SUDAN MEDICAL SERVICE.

This Service is responsible for carrying out civil, medical, and public health duties in the Sudan.

The staff consists of: (*a*) A Director, pay £1500–£2000. (*b*) A Senior Physician and a Senior Surgeon to the Khartoum and Omdurman Civil Hospitals, each with a pay of £1200–£1750. (*c*) An Assistant Director and Medical Officer of Health. Khartoum Province, pay £1200–£1750. (This latter post is temporary, and the terms and duties are subject to alteration). (*d*) 31 British "Senior Medical Inspectors" and "Medical Inspectors," whose pay commences at £720 and rises, subject to the recommendation of the Director, by five biennial increases to £1080, and after 13 years' service to £1200. The Senior Medical Inspectors are eligible, by selection, for the four senior posts. All Medical Inspectors are appointed, in the first place, on probation for two years, and if at the end of that time they are accepted for permanent service under the Sudan Government, the first increase of pay is subject to their passing an examination in Arabic.

In addition to the above there are (*e*) a number of Medical Officers trained at one of the Syrian Medical Schools, besides (*f*) Sudanese Medical Officers trained at the School of Medicine at Khartoum. There are several native (*g*) Assistant Medical Officers, who have been given a purely practical training in one of the larger hospitals in the Sudan.

Amongst the attractions of the Service are: The great variety of the work met with among many different races of the Sudan; *leave* of 90 days, which is granted every year after the first 18 months of service; *study-leave*, which may be given for some definite purpose, whilst two years towards pensionable service may be granted to those who have special qualifications and experience. The pension for Medical Inspectors who retire after 20 years' service is not less than £E.500 a year. If, however, he serves for a longer period, or is appointed to one of the higher posts, he will receive a larger pension. Private practice is allowed, but is limited to a few of the larger towns, and may be carried on so long as it does not interfere, in any way, with official duties. These duties include acting *as consultant* to the principal hospitals and the supervision of medical and public health work, the *inspection* of schools, the examination of candidates for Government service and pension, and the training of *Assistant* Medical Officers and native Sanitary Overseers. The Khartoum Medical School is staffed, mainly by members of the Medical Service, who receive an additional remuneration of £250 a year for their work as teachers. A Registrar of the Medical School is also selected from the Service, who receives £250 a year extra pay.

The country is developing rapidly, and the Medical Department is being increased to meet its growing requirements. Vacancies are always advertised in THE LANCET as they occur.

Candidates must be single and under 30 years of age, and they must have held a resident post, preferably that of house surgeon, in a large general hospital. As a rule they are required to take out a course in Tropical Medicine before they leave England for the Sudan. The fees for this course are paid by the Sudan Government, and in addition, an allowance of £4 15*s*. per week is made, under certain circumstances, to each selected candidate who attends it.

Inquiries for further information should be made to Dr. Acland, 19, Bryanston-square, London, W. 1, or to the Deans of the principal medical schools.

WOMEN'S MEDICAL SERVICE FOR INDIA.

AMONG careers open to medical women abroad the Women's Medical Service for India deserves honourable mention. This service is open to fully qualified medical women of British or Indian nationality, and with the present amount of Government subsidy the number of medical officers is limited to 44. Medical women proceeding to India to join the Women's Medical Service receive a sufficient sum for a first-class passage to India. On landing they are posted to one of the larger women's hospitals to gain Indian experience and to learn the language. During this period (from six months to two years) private practice is not allowed. For a further period they are appointed to act temporarily for medical women on furlough, during which time private practice is allowed. They are then definitely appointed to the charge of hospitals. Private practice is always allowed after the first two years, provided it does not interfere with official duties. The only exception is in administrative or educational posts, when an allowance in lieu of practice is given. The amount obtained from practice varies according to the station, but in most cases it forms a fair addition to the salary, varying from £150 to £1000 a year.

Excellent opportunities for surgery—especially gynæcological—are found in the Women's Medical Service. To those who are not keen surgeons opportunities are likely to open in the future in connexion with maternity and child welfare; medical women with administrative ability are also needed for the inspection of women's hospitals and other medical institutions.

Rates of pay are as follows:—

Years of service.	Overseas *allowance* per mensem.	Salary per mensem.	English equivalent* per annum.
1 to 3	Rs.100	Rs.450	£440
4 to 6	,,	Rs.500	£480
7 to 9	,,	Rs.550	£520
10 to 12	,,	Rs.600	£560
13 to 15	Rs.150	Rs.650	£600
16 to 18	,,	Rs.700	£640
19 to 21	,,	Rs.750	£680
22 to 24	,,	Rs.800	£720
over 24	,,	Rs.850	£760

* At rupee value 1*s*. 4*d*.

Furnished quarters are provided, *representing* an additional Rs.150 per mensem.

The cost of living in India is much higher than formerly, but it should be possible for a medical woman (with house provided) to meet actual household expenses for about Rs.200 per mensem, leaving the remainder of her salary for dress and personal expenses. To this must be added the necessary saving to meet additional expense for furlough and leave spent in the hills.

One month's privilege leave on full pay is granted each year. Furlough on half-pay at the rate of two months for every year of service is granted after every three years. Study-leave on two-thirds pay is granted to the extent of 12 months in the total service. There is a provident fund to which members of the service contribute 10 per cent. of their pay. The service contributes another 10 per cent., which accumulates at interest and is repaid on retirement.

Admission to the service is made by selection. Candidates in the United Kingdom should apply to the Hon. Secretary, United Kingdom Branch of the Countess of Dufferin's Fund, care of Major-General J. B. Smith, India Office, Whitehall, London.

Instruction in Tropical Medicine.—Every candidate selected for appointment will, unless the Secretary of State decides otherwise, be required to undergo a course of instruction either at the London School of Hygiene and Tropical Medicine, Endsleigh-gardens, N.W. 1, or at the Liverpool School of Tropical Medicine, Liverpool University, or at Edinburgh University. The cost of tuition will be borne by the Government, but candidates must make their own arrangements for board and lodging; an allowance of £25 a month will be paid to them monthly in arrear while they are under instruction. Payment of the allowance will be made subject to the candidate signing an agreement by which he is bound to refund it (1) if he declines to accept an appointment in any of the Colonies for which he may be selected; (2) if he fails to obtain a certificate or diploma; (3) if he relinquishes the Service for any other reason than mental or physical infirmity, or is removed for misconduct, within three years of his arrival in West Africa.

If at the end of the session there exists no vacancy in the Staff to which a candidate can be appointed, he will be placed in a Reserve and granted an allowance at the rate of £200 a year until the occurrence of a vacancy.

Leave of Absence.—European officers in West Africa may be granted vacation leave on full salary not exceeding in all one week's leave in the United Kingdom for every completed calendar month of total residential service in West Africa, plus the time necessarily taken on the journey to the United Kingdom, and, if the officer is returning to West Africa for further service, the time necessarily taken on the journey from the United Kingdom to the Colony. Vacation leave may be granted without any special grounds after 18 consecutive calendar months of residential service in West Africa. An officer will not be required to serve a tour of more than 24 consecutive calendar months' residential service except in special circumstances; and the Governor may grant vacation leave to any officer at any time after he has completed 12 consecutive calendar months' residential service within the above limits, the actual length of each officer's tour will be at the discretion of the Governor. Vacation leave on full salary may also be granted to an officer if he is invalided from West Africa after less than 12 consecutive calendar months' residential service, and sick leave on full salary may be granted for any period not exceeding six calendar months.

Appointments and Salaries.—Medical officers for the West African Colonies and Protectorates—namely, the Gambia, Sierra Leone, the Gold Coast (including Ashanti and the Northern Territories), and Nigeria (Southern and Northern Provinces)—are selected by the Secretary of State for the Colonies, and are on one list for employment and promotion. The grades and emoluments of the Staff are at present as follows:—

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A medical officer who has served for three years on the maximum salary of this scale (£960) without obtaining promotion is eligible, if recommended by the Governor, to be placed on the scale £1000–£50–£1150, with £100 seniority allowance (as for Senior Medical Officers).

Special Appointments.—The Director of the Medical Research Institute, Lagos, and the Director of the Medical Research Institute, Accra, receive a salary of £1300 a year, with a duty allowance of £260 a year, rising after five years' approved service to a salary at the rate of £1400 a year and duty allowance at the rate of £280 a year. There are a number of appointments for pathologists and bacteriologists in Nigeria and the Gold Coast. The salary and other conditions attached to these posts are similar to those of Medical Officers of Health. Duty allowances, seniority allowance, and staff pay are not pensionable emoluments.

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Payment of Salaries.—Information as to the payment of officers' salaries or of monthly remittances to persons in England may be obtained from the Crown Agents for the Colonies, 4, Millbank, S.W. 1. All allowances are paid locally.

All officers of the staff, except directors, deputy directors, assistant directors, senior sanitary officers, medical officers of health, research officers, and a few other officers holding special appointments, are at present allowed to take private practice, provided that it does not interfere with the faithful and efficient performance of their official duties, but it is within the power of the Governor to withdraw or suspend the privilege in such places and for such periods as he may consider desirable. Private practice does not exist at many stations, and no guarantee can be given that an officer will be posted to a station in which he will be able to practise privately. As a general rule, and subject to the exigencies of the service, stations where there is private practice are allocated to senior members of the Staff.

Pensions and Gratuities.—Pensions and gratuities on retirement are granted in accordance with the law and regulations of each individual Colony.

Fuller information can be obtained from the Private Secretary, Colonial Office, 2, Richmond-terrace, London, S.W.1.

SUDAN MEDICAL SERVICE.

This Service is responsible for carrying out civil, medical, and public health duties in the Sudan.

The staff consists of: (*a*) A Director, pay £1500–£2000. (*b*) A Senior Physician and a Senior Surgeon to the Khartoum and Omdurman Civil Hospitals, each with a pay of £1200–£1750. (*c*) An Assistant Director and Medical Officer of Health, Khartoum Province, pay £1200–£1750. (This latter post is temporary, and the terms and duties are subject to alteration). (*d*) 31 British "Senior Medical Inspectors" and "Medical Inspectors," whose pay commences at £720 and rises, subject to the recommendation of the Director, by five biennial increases to £1080, and after 13 years' service to £1200. The Senior Medical Inspectors are eligible, by selection, for the four senior posts. All Medical Inspectors are appointed, in the first place, on probation for two years, and if at the end of that time they are accepted for permanent service under the Sudan Government, the first increase of pay is subject to their passing an examination in Arabic.

In addition to the above there are (*e*) a number of Medical Officers trained at one of the Syrian Medical Schools, besides (*f*) Sudanese Medical Officers trained at the School of Medicine at Khartoum. There are several native (*g*) Assistant Medical Officers, who have been given a purely practical training in one of the larger hospitals in the Sudan.

Amongst the attractions of the Service are: The great variety of the work met with among many different races of the Sudan; *leave* of 90 days, which is granted every year after the first 18 months of service; *study-leave*, which may be given for some definite purpose, whilst two years towards pensionable service may be granted to those who have special qualifications and experience. The pension for Medical Inspectors who retire after 20 years' service is not less than £E.500 a year. If, however, he serves for a longer period, or is appointed to one of the higher posts, he will receive a larger pension. Private practice is allowed, but is limited to a few of the larger towns, and may be carried on so long as it does not interfere, in any way, with official duties. These duties include acting as consultant to the principal hospitals and the supervision of medical and public health work, the inspection of schools, the examination of candidates for Government service and pension, and the training of Assistant Medical Officers and native Sanitary Overseers. The Khartoum Medical School is staffed, mainly by members of the Medical Service, who receive an additional remuneration of £250 a year for their work as teachers. A Registrar of the Medical School is also selected from the Service, who receives £250 a year extra pay.

The country is developing rapidly, and the Medical Department is being increased to meet its growing requirements. Vacancies are always advertised in THE LANCET as they occur.

Candidates must be single and under 30 years of age, and they must have held a resident post, preferably that of house surgeon, in a large general hospital. As a rule they are required to take out a course in Tropical Medicine before they leave England for the Sudan. The fees for this course are paid by the Sudan Government, and in addition, an allowance of £4 15*s*. per week is made, under certain circumstances, to each selected candidate who attends it.

Inquiries for further information should be made to Dr. Acland, 19, Bryanston-square, London, W. 1, or to the Deans of the principal medical schools.

WOMEN'S MEDICAL SERVICE FOR INDIA.

AMONG careers open to medical women abroad the Women's Medical Service for India deserves honourable mention. This service is open to fully qualified medical women of British or Indian nationality, and with the present amount of Government subsidy the number of medical officers is limited to 44. Medical women proceeding to India to join the Women's Medical Service receive a sufficient sum for a first-class passage to India. On landing they are posted to one of the larger women's hospitals to gain Indian experience and to learn the language. During this period (from six months to two years) private practice is not allowed. For a further period they are appointed to act temporarily for medical women on furlough, during which time private practice is allowed. They are then definitely appointed to the charge of hospitals. Private practice is always allowed after the first two years, provided it does not interfere with official duties. The only exception is in administrative or educational posts, when an allowance in lieu of practice is given. The amount obtained from practice varies according to the station, but in most cases it forms a fair addition to the salary, varying from £150 to £1000 a year.

Excellent opportunities for surgery—especially gynæcological—are found in the Women's Medical Service. To those who are not keen surgeons opportunities are likely to open in the future in connexion with maternity and child welfare; medical women with administrative ability are also needed for the inspection of women's hospitals and other medical institutions.

Rates of pay are as follows:—

Years of service.	Overseas allowance per mensem.	Salary per mensem.	English equivalent* per annum.
1 to 3	Rs.100	Rs.450	£440
4 to 6	,,	Rs.500	£480
7 to 9	,,	Rs.550	£520
10 to 12	,,	Rs.600	£560
13 to 15	Rs.150	Rs.650	£600
16 to 18	,,	Rs.700	£640
19 to 21	,,	Rs.750	£680
22 to 24	,,	Rs.800	£720
over 24	,,	Rs.850	£760

* At rupee value 1*s*. 4*d*.

Furnished quarters are provided, representing an additional Rs.150 per mensem.

The cost of living in India is much higher than formerly, but it should be possible for a medical woman (with house provided) to meet actual household expenses for about Rs.200 *per mensem*, leaving the remainder of her salary for dress and personal expenses. To this must be added the necessary saving to meet additional expense for furlough and leave spent in the hills.

One month's privilege leave on full pay is granted each year. Furlough on half-pay at the rate of two months for every year of service is granted after every three years. Study-leave on two-thirds pay is granted to the extent of 12 months in the total service. There is a provident fund to which members of the service contribute 10 per cent. of their pay. The service contributes another 10 per cent., which accumulates at interest and is repaid on retirement.

Admission to the service is made by selection. Candidates in the United Kingdom should apply to the Hon. Secretary, United Kingdom Branch of the Countess of Dufferin's Fund, care of Major-General J. B. Smith, India Office, Whitehall, London.

Instruction in Tropical Medicine.—Every candidate selected for appointment will, unless the Secretary of State decides otherwise, be required to undergo a course of instruction either at the London School of Hygiene and Tropical Medicine, Endsleigh-gardens, N.W. 1, or at the Liverpool School of Tropical Medicine, Liverpool University, or at Edinburgh University. The cost of tuition will be borne by the Government, but candidates must make their own arrangements for board and lodging; an allowance of £25 a month will be paid to them monthly in arrear while they are under instruction. Payment of the allowance will be made subject to the candidate signing an agreement by which he is bound to refund it (1) if he declines to accept an appointment in any of the Colonies for which he may be selected; (2) if he fails to obtain a certificate or diploma; (3) if he relinquishes the Service for any other reason than mental or physical infirmity, or is removed for misconduct, within three years of his arrival in West Africa.

If at the end of the session there exists no vacancy in the Staff to which a candidate can be appointed, he will be placed in a Reserve and granted an allowance at the rate of £200 a year until the occurrence of a vacancy.

Leave of Absence.—European officers in West Africa may be granted vacation leave on full salary not exceeding in all one week's leave in the United Kingdom for every completed calendar month of total residential service in West Africa, plus the time necessarily taken on the journey to the United Kingdom, and, if the officer is returning to West Africa for further service, the time necessarily taken on the journey from the United Kingdom to the Colony. Vacation leave may be granted without any special grounds after 18 consecutive calendar months of residential service in West Africa. An officer will not be required to serve a tour of more than 24 consecutive calendar months' residential service except in special circumstances; and the Governor may grant vacation leave to any officer at any time after he has completed 12 consecutive calendar months' residential service within the above limits, the actual length of each officer's tour will be at the discretion of the Governor. Vacation leave on full salary may also be granted to an officer if he is invalided from West Africa after less than 12 consecutive calendar months' residential service, and sick leave on full salary may be granted for any period not exceeding six calendar months.

Appointments and Salaries.—Medical officers for the West African Colonies and Protectorates—namely, the Gambia, Sierra Leone, the Gold Coast (including Ashanti and the Northern Territories), and Nigeria (Southern and Northern Provinces)—are selected by the Secretary of State for the Colonies, and are on one list for employment and promotion. The grades and emoluments of the Staff are at present as follows:—

The Director of the Medical and Sanitary Service, Nigeria, receives a salary of £1800 a year, with a duty allowance at the rate of £360 a year. The Director of Medical and Sanitary Service in the Gold Coast receives a salary of £1600 a year, with a duty allowance at the rate of £320 a year. The Director of Medical and Sanitary Service in Sierra Leone receives a salary of £1400 a year, with a duty allowance at the rate of £280 a year. The Deputy Director of Medical and Sanitary Service, Nigeria, and the Deputy Director of Sanitary Service, Nigeria, receive salaries of £1500 a year, with duty allowances at the rate of £300 a year. The Deputy Director of Medical and Sanitary Service, Gold Coast, and the Assistant Director of Medical and Sanitary Services, Nigeria, receive salaries of £1400 a year, with duty allowances at the rate of £280 a year. Assistant Directors Medical Service: There are seven appointments on this grade, five in Nigeria, two in the Gold Coast. The salary is at the rate of £1300 a year, with duty allowance at the rate of £260 a year. The Assistant Director of Sanitary Service, Nigeria, the Deputy Director of Sanitary Service in the Gold Coast and the Deputy Director of Sanitary Service in Sierra Leone receive salary at the rate of £1300 a year, with duty allowance at the rate of £260 a year. Specialists: The number of these appointments is not fixed, officers of outstanding professional merit being eligible for appointment. The salary is at the rate of £1300 a year, with duty allowance at the rate of £260 a year. After five years' approved service as such, the specialist officer is eligible to receive a salary at the rate of £1400 a year, with duty allowance at the rate of £280 a year. There are at present five officers appointed specialists in Nigeria, three in the Gold Coast, and one in Sierra Leone. Senior Medical Officer: There are twenty appointments of this grade, with salary at the rate of £1000 a year, rising by annual increments of £50 to £1150 a year, and seniority allowance at the rate of £100 a year. The Senior Medical Officer, Gambia, is allowed "staff pay" of £150 a year, in addition to duty allowance, but he is debarred from private practice. Senior Sanitary Officer: There are nine appointments of this grade, with salary at the rate of £1050 a year, rising by annual increments of £50 to £1200 a year, and a duty allowance at the rate of £210 a year. Possession of the Diploma in Public Health is usually required for appointment to this grade. Special facilities are granted to study for the diploma during leave. Medical Officers of Health: There are at present 24 appointments of this grade. The salary scale is the same as that of Medical Officers, except that Medical Officers of Health are granted an initial salary at the rate of £800 a year, together with seniority allowance at the rate of £72 a year and staff pay at the rate of £150 a year, half of which is payable during leave. After three years' service on the maximum of the scale, viz., £960 a year, and on undergoing an approved course of study, Medical Officers of Health are eligible, if unpromoted, subject to the recommendation of the Governor, to be placed on the scale £1000 a year rising by annual increments of £50 to £1150 a year, together with seniority allowance at the rate of £100 a year and staff pay as before. The holders of these appointments are not allowed private practice. Candidates selected for service as Medical Officers of Health must obtain the Diploma in Tropical Medicine and Hygiene of Cambridge, London, or Liverpool as a condition of appointment, or must be in possession of the Diploma in Public Health. They are appointed subject to the condition that, if after a period of service in West Africa they are considered unsuitable to serve in that capacity, they may be called upon to transfer to the medical side. In such cases the officers are given the rate of salary which they would have reached if they had been appointed to be Medical Officers instead of Medical Officers of Health in the first instance. Medical Officer: The salary attached to this grade is at the rate of £660 a year, rising by annual increments of £30 to £720 a year. Then, if confirmed in the appointment, £720 a year, rising by annual increments of £40 to £960, with seniority allowance at the rate of £72 a year. Before passing £800, medical officers are required to take a special course of study for three months. If they obtain satisfactory certificates at the end of the course they draw their further increments up to £960 a year.

A medical officer who has served for three years on the maximum salary of this scale (£960) without obtaining promotion is eligible, if recommended by the Governor, to be placed on the scale £1000–£50–£1150, with £100 seniority allowance (as for Senior Medical Officers).

Special Appointments.—The Director of the Medical Research Institute, Lagos, and the Director of the Medical Research Institute, Accra, receive a salary of £1300 a year, with a duty allowance of £260 a year, rising after five years' approved service to a salary at the rate of £1400 a year and duty allowance at the rate of £280 a year. There are a number of appointments for pathologists and bacteriologists in Nigeria and the Gold Coast. The salary and other conditions attached to these posts are similar to those of Medical Officers of Health. Duty allowances, seniority allowance, and staff pay are not pensionable emoluments.

Increments.—Increments to salaries are payable only when the service of an officer during the period of employment qualifying for increment is approved.

Payment of Salaries.—Information as to the payment of officers' salaries or of monthly remittances to persons in England may be obtained from the Crown Agents for the Colonies, 4, Millbank, S.W. 1. All allowances are paid locally.

All officers of the staff, except directors, deputy directors, assistant directors, senior sanitary officers, medical officers of health, research officers, and a few other officers holding special appointments, are at present allowed to take private practice, provided that it does not interfere with the faithful divided into two parts, of which the first is concerned with bacteriological principles and with general technique. The second part of the course is to be devoted to bacteriology applied to (1) clinical medicine, (2) hygiene, or (3) industry, at the selection of the candidate.

Public Health: Epidemiology and Vital Statistics.—A course in Epidemiology and Vital Statistics is provided by the London School of Hygiene and Tropical Medicine, under Prof. Greenwood, at the National Institute for Medical Research, Hampstead. Preference is given to medical graduates, and students cannot normally be admitted for a course of less than three months.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

The Universities of Cambridge, London, Durham, Leeds, Manchester, Edinburgh, Dublin, National University of Ireland, and the Conjoint Board of the R.C.P. Lond. and R.C.S.Eng. now grant diplomas in psychological medicine under conditions that are fairly comparable in the standard of the tests and in the duration of the courses; the details on these points can be obtained from the various examination bodies.

In London, courses of instruction for the Diploma in Psychological Medicine are given annually at the Maudsley Hospital, Denmark Hill, which has recently been definitely recognised as a school of the University of London. The course consists of two parts, commencing in January, and is adapted for the diploma of the Conjoint Board, the University of London, or the University of Cambridge. The parts may be taken separately; also during the year there are other short courses, lectures and demonstrations in psychological medicine.

Maudsley Hospital.—Appointments as clinical assistants are obtainable at the Maudsley Hospital. The holding of such appointments for varying periods satisfies the requirements of the different examining bodies in respect of practical study of mental disorders. The appointments and other facilities for clinical experience are open to qualified medical practitioners apart from the courses of instruction. Inquiries as to lectures should be addressed to the Director of the Central Pathological Laboratory, Maudsley Hospital, Denmark Hill, S.E.: and as to clinical facilities, to the Medical Superintendent at the same address.

Bethlem Royal Hospital.—A course of lectures and practical instruction for the Diploma in Psychological Medicine, granted by the various universities and the Conjoint Board, is held at Bethlem Royal Hospital, London, S.E., twice annually, during the spring and autumn. The fee for the full course is 15 guineas. Part A or Part B, however, may be taken separately at a fee of 10 guineas per part. In addition to the above, clinical instruction in Psychological Medicine is given at Bethlem Royal Hospital every morning (except Wednesdays) at 11 A.M. The fee for students is 3 guineas for a period of three months' attendance and for post-graduates a fee of 5 guineas for a like period. A reduction is made to those who attend the Diploma Course. House physicians are appointed at Bethlem Royal Hospital for a term of six months, which may be extended. These appointments are made on May 1st and Nov. 1st in each year and the vacancies are advertised in the medical papers. Apartments, complete board, attendance, and laundry are provided and also a salary at the rate of £100 per annum. Clinical assistants are often appointed from time to time for periods of three months or longer. These are non-salaried and non-resident posts, but partial board is provided. The Physician-Superintendent, Bethlem Royal Hospital, will supply further particulars.

University of Edinburgh.—Candidates for the Diploma in Psychiatry must be graduates in medicine and surgery of the University of Edinburgh or hold corresponding registrable degrees or qualifications of some other licensing body. Candidates are required subsequent to the date of graduation or obtaining a registrable qualification to have held (*a*) a resident appointment for one year in a hospital for mental disorders approved by the Faculty of Medicine, or alternatively (*b*) a six months' appointment as defined in (*a*) and six months' practical study of nervous diseases in a special or general hospital approved by the Faculty of Medicine. There are two examinations for the Diploma. Part I. comprises 1. Anatomy of the Nervous System. 2. Physiology of the Nervous System. 3. Psychology and Experimental Psychology. Part II. comprises: 1. Neuropathology. 2. Clinical Psychiatry. 3. Clinical Neurology. 4. An additional subject selected by the candidate from a prescribed list. The examinations are held twice yearly in March and July. Candidates who have held an asylum appointment for a period of five years or more may be exempted from the course of study in one or more subjects of the curriculum. Full particulars can be obtained from the Dean of the Faculty of Medicine.

Dublin University.—A post-graduate diploma in Psychological Medicine is conferred upon registered medical practitioners who have held a resident medical appointment at a recognised institution for the treatment of Mental Diseases for 12 months, or who have held such an appointment for six months and have attended clinical instruction at an approved institution for six months. Candidates must also attend special courses of instruction and pass a special examination. Details can be obtained from the Registrar of the School of Physic, Trinity College, Dublin.

The National University of Ireland and the *Conjoint Board of the Royal Colleges of Ireland*[*] confer a diploma in Psychological Medicine upon similar terms; application should be made to the Registrar of the School of Physic and the Secretary of the Board respectively.

DIPLOMA IN OPHTHALMIC MEDICINE.

Special diplomas in ophthalmic medicine and surgery are issued by two examining bodies.

University of Oxford.—The diploma in ophthalmology (D.O.) is granted to registered medical practitioners after passing an examination, held annually in March, which is open to candidates who have pursued at Oxford a course of study in ophthalmology over a period of at least two months and who have attended a 12 months' recognised hospital course. Further information regarding these requirements may be obtained from the Dean of the School of Medicine.

Conjoint Board R.C.P. Lond., R.C.S. Eng.—The Conjoint Board grants the D.O.M.S. after an examination held in two parts, twice yearly in February and July. Part I. comprises anatomy and embryology of the visual apparatus, physiology of vision, and elementary optics. Part II. comprises optical defects, ophthalmic medicine and surgery, and pathology with special reference to ophthalmology. The examination in each case is written, oral, and practical or clinical. Candidates may only enter for Part II. on completion of a year of special study of ophthalmology after obtaining a registrable diploma or a Degree in Medicine and Surgery of a University recognised by the Board.

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

University of Cambridge.—The D.M.R.E. is open only to those who have held for at least one year a medical qualification approved by the Committee. The new regulations, which come into operation this year, in some respects materially alter the scope of

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[*] No returns.

SPECIAL DIPLOMAS.

DIPLOMA IN TROPICAL MEDICINE.

ALTHOUGH a qualification in tropical medicine has not been made registrable by statute, a diploma is regarded as indispensable for appointments in the Colonial Medical Service and similar positions abroad. Systematic instruction for these diplomas is given at the Incorporated Liverpool School of Tropical Medicine (founded in 1898) and at the London School of Hygiene and Tropical Medicine, 23, Endsleigh-gardens, Euston-road, N.W.; while the Universities of Cambridge, London, Edinburgh, and the English Conjoint Board grant the diploma.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE (*University of London*).—The Departments of Bacteriology and Immunology under Prof. Topley, and of Epidemiology and Vital Statistics under Prof. Greenwood, will continue their advanced courses of study in October next, the Bacteriology course (covering the new Diploma) at 6, Gordon-square, W.C., and the Epidemiology course at the National Institute for Medical Research at Hampstead. The existing Departments of the School dealing with the courses of study for Tropical Medicine and Hygiene will continue for the present in the building occupied by the Hospital for Tropical Diseases at Endsleigh-gardens. There are two such courses in the year, each lasting 20 weeks, inclusive of examinations. The dates for the commencement of each course are Oct. 1st, 1928, and March 11th, 1929, respectively. The course covers the work required for the D.T.M. and H. (England) and part of that required for the M.D. in Tropical Medicine of the University of London. For facilities for clinical and pathological study the School is indebted to the Seamen's Hospital Society, who, prior to August 1st, 1924, were responsible for the London School of Tropical Medicine. The new building in which the School will be housed is approaching completion, and the formal opening and the commencement of the new courses of study (in particular that of the D.P.H.) will probably be in the summer or autumn of next year. Research studentships and scholarships are available, and full particulars with regard to these and the courses of study generally may be obtained from the Secretary of the School, Malet-street, London, W.C. 1.

University of Liverpool.—The University grants a Diploma in Tropical Medicine. At the end of each full course an examination is held by the University for its Diploma of Tropical Medicine (D.T.M.), which is open only to those who have been through the course of instruction of the school. The subjects of examination are (*a*) Tropical Pathology, Tropical Parasitology; (*b*) Entomology; (*c*) Tropical Hygiene and Sanitation; (*d*) Tropical Medicine, including Ætiology, Symptoms, Diagnosis, and Treatment of Tropical Diseases. The advanced course consists entirely of Practical and Clinical Laboratory Work, given at the laboratory at the University. Applications should be made to the Dean of the Medical Faculty, University of Liverpool.

The University also grants a diploma in Tropical Hygiene (D.T.H.). The subjects of examination are Bacteriology, Chemistry (including Meteorology and Climatology), Parasitology and Entomology, Tropical Sanitation (including Sanitary Engineering), Practical Sanitation, Sanitary Engineering, Statistics. Two University Fellowships of £100 a year each are open to students of the school, amongst others. Accommodation for research work is to be had at the University Laboratory. The Mary Kingsley Medal is awarded by the school for distinguished work in connexion with Tropical Medicine.

University of Cambridge.—The examination for the Diploma in Tropical Medicine and Hygiene is divided into two parts. Part I. is held in Cambridge in April and Part II. in July in London. Candidates for Part I. are examined under the same regulations and in the same subjects as candidates for the Diploma in Public Health, but any qualification in medicine or surgery recognised by the proper authority of any country outside the British Dominions may be recognised. The subjects for Part II. are Medicine, Surgery, and Hygiene in their relation to Tropical Disease.

The examination will be partly in writing, partly oral, and partly practical or clinical (the clinical part will be conducted at a hospital for tropical diseases, at which cases will be submitted for diagnosis and comment). Every candidate who passes the examination to the satisfaction of the examiners will receive from the University a diploma (D.T.M. & H.) testifying to his knowledge and skill in tropical medicine and hygiene.

Further information respecting the courses of study and examinations may be obtained from Mr. J. E. Purvis, Public Health Chemical Laboratory, Cambridge.

University of Edinburgh.—Candidates for the Diploma in Tropical Medicine and Hygiene must be graduates in medicine and surgery of the University of Edinburgh or hold corresponding registrable degrees or qualifications of some other licensing body. The course of instruction, comprising a primary and a second course, is given during the autumn and spring terms, October to March, and includes Tropical Hygiene, Bacteriology, Entomology and Parasitology, Diseases of Tropical Climates (systematic and clinical), Tuberculosis, and Venereal Diseases. The primary course alone is also given during the summer term, April to June. Provision is made in the University for instruction in all subjects. The examinations are written, oral, and practical, and are held at the end of the courses. Candidates are required on the first occasion of presenting themselves for examination to appear for all the subjects. Candidates who fail to pass the entire examination within a period of 12 months after first appearance are required to reappear for all the subjects. The University is included in the list of Institutions whose courses of instruction in Tropical Medicine may be taken by officers on appointment to the Colonial Medical Services or during study-leave. Full particulars can be obtained from the Dean of the Faculty of Medicine.

Conjoint Board R.C.P. Lond., R.C.S. Eng.—The diploma of D.T.M. & H. Eng. is awarded on the results of an examination held twice yearly, in February and July. Candidates must possess a registrable qualification, and produce evidence of having attended (1) practical instruction in pathology, protozoology, helminthology, entomology, bacteriology, and hygiene in relation to tropical medicine in a recognised institution during not less than five months; (2) clinical practice of a recognised hospital for the same period. Conditions of study may be modified in the case of candidates of special experience. Notice of entry to the Secretary, Examination Hall, Queen-square, London, W.C.1.

DIPLOMA IN BACTERIOLOGY.

The University of London has instituted an academic diploma in bacteriology, and a full time course covering this diploma will be given in October by the London School of Hygiene and Tropical Medicine. This course will be held at 6, Gordon-square, London, W.C. 1, pending the opening of the new buildings behind the British Museum which are now under construction. The diploma is open to graduates in medicine, science, or pharmacy of London or of any other approved university. Registered medical practitioners or other non-graduate students who have obtained a qualification and undergone a previous training which in the opinion of the University has fitted them to profit by the instruction may be admitted. The course of study, which extends over an academic year, is

Candidates will be admissible to Examination in Part I. on producing evidence:—

1. Of being in possession of a registrable qualification in Medicine, Surgery, and Midwifery.

2. Of having attended during a period of not less than five months at an Institution recognised by the Examining Board in England, practical instruction in (a) Bacteriology and Parasitology (including Medical Entomology) especially in their relation to diseases of man and to those diseases of the lower animals which are transmissible to man, during 180 hours, of which not less than 150 hours have been occupied in practical laboratory work. (b) Chemistry and Physics in relation to public health, during 90 hours, of which not less than 70 hours have been occupied in practical laboratory work. (c) Meteorology and Climatology in relation to public health, during not less than 10 hours.

Candidates will be admitted to Part II. of the Examination on producing evidence:—

1. Of having been in possession of a registrable qualification in Medicine, Surgery, and Midwifery during not less than two years, of being registered by the General Medical Council, and of having completed the curriculum for the Diploma extending over a period of 12 calendar months subsequent to the attainment of a registrable qualification.

2. Of having attended, after obtaining the registrable Qualification, instruction during not less than 80 hours at an Institution recognised by the Examining Board in England in the following subjects:—(a) The Principles of Public Health and Sanitation for not less than 30 hours; (b) Epidemiology and Vital Statistics for not less than 20 hours; (c) Sanitary Law and Administration (including Public Medical Services) during not less than 20 hours; (d) Sanitary Construction and Planning during not less than 10 hours.

3. Of having attended for three months the clinical practice of a hospital for infectious diseases recognised by the Examining Board in England and of having therein received instruction in the methods of administration. The certificate must state that the candidate has attended on one or more days in each week of the three months, that each attendance was of two hours' duration, with a total attendance of 60 hours.

4. Of having been engaged during a period of not less than six months in acquiring a practical knowledge of the duties, routine and special, of public health administration under the supervision of a Medical Officer of Health, and of having received, from such officer or other competent Medical Officer during not less than three hours on each of 60 working days, practical instruction in those duties and also those relating to: (a) Maternity and Child Welfare Service; (b) Health Service for children of school age, (c) Venereal Diseases Service; (d) Tuberculosis Service; (e) Industrial Hygiene; (f) Inspection and Control of Food; including meat and milk.

The above certificate (4) must be obtained from a Medical Officer of Health who devotes his whole time to public work, or from a Medical Officer of Health of a Sanitary Area having a population of not less than 50,000, or in Ireland the Medical Superintendent Officer of Health of a County or County Borough having a population of not less than 50,000.

University of Oxford.—An examination, conducted partly in writing, partly vivâ voce, and in each subject partly practical, is held in Michaelmas and in Trinity Term in the following subjects:—General Hygiene, General Pathology (with special relation to Infectious Diseases), the Laws relating to Public Health, Sanitary Engineering, Vital Statistics. The examination is in two parts, which may be taken together or separately; but Part I. must be passed either before or at the same examination as Part II.

The First Part of the examination will comprise (a) written papers of three hours each in (i.) Chemistry and Physics, and (ii.) Pathology and Bacteriology; (b) a three hours' practical and vivâ voce examination in Chemistry and Physics; (c) a three hours' practical and vivâ voce examination in Pathology and Bacteriology.

The Second Part of the Examination will consist of the following parts:—(a) Two written papers, each of three hours, dealing with General Hygiene (including Sanitary Engineering, Vital Statistics, and the Laws relating to Public Health); (b) a practical and vivâ voce examination in General Hygiene; and (c) a three hours' practical and vivâ voce examination in Pathology and Bacteriology.

Candidates in Part I. of the examination will be required to produce certificates (1) of Laboratory Work in Chemistry, Physics, Meteorology, and Climatology as applied to Hygiene, and (2) of having had Practical Instruction in Bacteriology and Parasitology and the Pathology of the Diseases of Animals transmissible to Man.

Candidates in Part II. will produce the following further certificates: (3) of a Practical Knowledge of the Duties, Routine and Special, of Public Health Administration; and (4) of having attended the practice of a Hospital for Infectious Diseases at which opportunities are afforded for the study of the Methods of Administration.

All the above degrees are now open to Women Students, and particulars of Scholarships and Prizes may be obtained from the Principals of the various Ladies' Colleges. The names of candidates for the Diploma in Public Health must be sent to the Assistant Registrar of the University, Clarendon Building, Oxford. Applications for any further information should be addressed to the Dean, Department of Medicine, Museum, Oxford.

University of Cambridge.—Two examinations in so much of State medicine as is comprised in the functions of medical officers of health are held during the year. The examination is divided into two parts and demands proficiency in all the branches of study which bear upon the duties of medical officers of health. The examinations in both parts will be oral and practical, as well as in writing. Candidates may present themselves for either part separately or for both together at their option; but the result of the examination in the case of any candidate will not be published until he has satisfied the examiners in both parts. Marks of distinction will be placed against the names of candidates who have specially distinguished themselves in either (1) Part I. of the examination; or (2) Part II. of the examination. Candidates must before admission to either part of the examination produce evidence of having satisfied the regulations applicable to Part I. and Part II. The examination for Part I. is in April and for Part II. in October.

For Part I. of the examination courses of lectures and laboratory instruction are given in the University on Hygiene, Chemistry, &c., and on Bacteriology and Parasitology. For Part II. the Medical Officer of Health for Cambridge gives courses on Practical Sanitary Administration and in the Administrative Methods of the Infectious Diseases Hospital; and the Medical Officer of Health to the Cambridgeshire County Council, on Sanitary Laws, School Hygiene, Epidemiology. There are also courses by special lecturers in Vital Statistics, Tuberculosis Service, Venereal Diseases Service, Industrial Hygiene, Maternity and Child Welfare. These courses are open to non-members of the University.

A special Diploma in Hygiene is granted to medical graduates whose qualifications are not registrable in England. The courses and examinations are the same as for the Diploma in Public Health (except that the candidates are not examined in English Sanitary Laws).

All applications for further information respecting examinations and the courses of study should be addressed to Mr. Purvis, Public Health Chemical Laboratory, Cambridge.

University of London.—Candidates for the M.D. Degree may offer State Medicine as a subject in which to graduate. The regulations have been revised and may be obtained on application to the Academic Registrar, University of London, South Kensington.

University of Durham.—The Degree of Bachelor of Hygiene (B.Hy.) and the Diploma in Public Health (D.P.H.).—No candidate is admitted to the final examination for the Degree of B.Hy. unless he is a Bachelor of Medicine and Surgery, of not less than two years' standing, of a recognised University whose degrees are registrable on the books of the General Medical Council of the United Kingdom, and no candidate is admitted to the final examination the Diploma. The course now occupies nine months, beginning in October. The first three months, which can be spent either in Cambridge or in London, are occupied with lectures and practical work in Physics in preparation for the examination for Part I. in January, and an introductory course in Radiology and Electrology. The second three months must be spent in London. The course includes lectures and clinical instruction in Radiology and Electrology, with clinical practice in the radiological department of a hospital approved for that purpose by the Committee. The examination for Part II. is held in April. During the final three months a candidate must hold a clinical clerkship or similar appointment in a radiological department approved by the Committee, and must then present a thesis in the form of a critical report with notes upon six cases either in Radiology or in Electrology or in both these subjects, illustrating various methods of diagnosis or treatment. A number of large provincial hospitals have been approved by the Committee to take clinical assistants for this part of the course.

Further particulars as to courses and examinations may be obtained from G. Stead, M.A., Cavendish Laboratory, Cambridge, or from Dr. Stanley Melville, British Institute of Radiology, 32, Welbeck-street, London, W. 1.

University of Liverpool.—Candidates before admission to the examination for this diploma must possess a registrable qualification, approved by the University in medicine and surgery, and must have attended courses of instruction in (*a*) physics (two terms), (*b*) (*i*) *radiology, and* (*ii*) *electrology during* six months in the X ray and electrotherapeutic departments of a hospital or hospitals. An examination is held in March each year, the subjects being (*a*) physics, (*b*) radiology and electrology. Examination in either part may be taken separately. Fees: tuition, £24 5*s.*; examination and diploma, £6 5*s.* These courses commence during the first week in October. Application should be made to the Dean, Faculty of Medicine, the University of Liverpool.

University of Edinburgh.—Candidates for the Diploma in Radiology (D.R. Univ. Edin.) must be graduates in medicine and surgery of the University of Edinburgh or hold corresponding registrable degrees or qualification from some other licensing body. Candidates are not admitted to the examination for the Diploma until after the lapse of not less than one year from obtaining a registrable qualification, which qualification must be registered before admission to the Examination. The course of study begins in October and extends over a period of not less than three terms. The Examination, which is written, oral, and practical, is in two parts: (*a*) Physics, and (*b*) Radiology. The Examination is held twice yearly —viz., July and October. Full particulars may be obtained from the Dean of the Faculty of Medicine.

DIPLOMA IN LARYNGOLOGY AND OTOLOGY.

The Conjoint Board R.C.P. Lond., R.C.S. Eng., grants the D.L.O. after an examination held in two parts, twice yearly, in June and December. Part I. comprises anatomy, embryology, and physiology of the ear, nose, pharynx, larynx, trachea and bronchi, and œsophagus. Part II. comprises the medicine, surgery, and pathology of the ear, nose, pharynx, larynx, trachea and bronchi, and œsophagus, and the recognition and use of special instruments and appliances. The examination in each case is written, oral, and practical or clinical. Candidates may only enter for Part II. on completion of one year of special study of the diseases of the ear, nose, pharynx, and larynx, after obtaining a registrable qualification, or a degree in medicine and surgery of a University recognised by the Board. The fee for admission to each part is 6 guineas.

DIPLOMA IN TUBERCULOUS DISEASES.

A Diploma in Tuberculous Diseases is given by the University of Wales. Candidates must possess a medical qualification registrable for practice in Great Britain and Ireland, and be not less than 25 years of age, and either (Category A) have held, for a period of not less than five years, whole-time appointments for work in tuberculosis; or (Category B) have held a registrable qualification to practise for at least one year, and presented (*a*) a certificate of satisfactory pursuance of a course of consecutive post-graduate study of the clinical and epidemiological aspects of tuberculosis of six months' duration at a recognised university, medical school, or hospital where such a course is given; or, alternatively, a certificate of one year's post-graduate work as a whole-time member of the staff of a tuberculosis hospital, sanatorium, or dispensary approved by the Ministry of Health, signed by the representative of the authorities for whom the work was performed or by the administrative medical officer concerned; (*b*) a certificate of satisfactory pursuance of a course of consecutive post-graduate practical study of the Pathology and Bacteriology of Tuberculosis of three months' duration at a tuberculosis laboratory or a recognised general laboratory where such a course is given; (*c*) a certificate of three months' satisfactory attendance at a tuberculosis institute or dispensary.

The examination is divided into two parts and the fee is £10 10*s.* Applications should be made to the Registrar of the University, University Registry, Cathays Park, Cardiff, not later than May 15th. The above regulations apply up to and including the next examination, to be held in June, 1929. New regulations, particulars of which may be obtained on application to the Registrar, will come into force for 1930.

The Cecil Prosser Research Scholarship, of the value of £250 for one year, is awarded triennially for research in Tuberculosis.

DIPLOMA IN PUBLIC HEALTH.

THE following epitomises the instruction given at various universities and centres of medical education to medical men desiring to obtain diplomas in sanitary science, public health, hygiene or State medicine, as this discipline is variously called. Resolutions, designed with a view of ensuring "the possession of a distinctively high proficiency, scientific and practical, in all the branches of study which concern the public health," have been adopted at various times by the General Medical Council. The diploma is registrable by the Council, whose rules on the curriculum become *binding on the educational* bodies concerned. The new regulations, which came into force in 1924, extend the period of study and postpone the granting of a diploma until at least two years from qualification.

Conjoint Board of the R.C.P. Lond. and R.C.S. Eng. New regulations came into force on Jan. 1st, 1924, which apply to all candidates who have not commenced bona-fide study of Public Health in accordance with the above regulations before that date. They are as follows: *The Examination* consists of two Parts. Part I. will be held in the months of January, April, and June, and Part II. in the months of January, April, and July in each year. Candidates may enter for Parts I. and II. separately or at the same time, but they must pass Part I. before proceeding to Part II. The Examination in each part will be written, oral, and practical. Part II. will include a practical examination in Infectious *Diseases, Food Inspection*, and Inspection of selected Premises. Candidates who fail to satisfy the Examiners in either part may present themselves again at the next *Examination on* payment of the same fees. Candidates intending to present themselves for either part of the Examination must give 11 days' notice in writing to the Secretary, at the Examination Hall, Queen-square, London, W.C. 1.

Candidates will be admissible to Examination in Part I. on producing evidence :—

1. Of being in possession of a registrable qualification in Medicine, Surgery, and Midwifery.

2. Of having attended during a period of not less than five months at an Institution recognised by the Examining Board in England, practical instruction in (*a*) Bacteriology and Parasitology (including Medical Entomology) especially in their relation to diseases of man and to those diseases of the lower animals which are transmissible to man, during 180 hours, of which not less than 150 hours have been occupied in practical laboratory work. (*b*) Chemistry and Physics in relation to public health, during 90 hours, of which not less than 70 hours have been occupied in practical laboratory work. (*c*) Meteorology and Climatology in relation to public health, during not less than 10 hours.

Candidates will be admitted to Part II. of the Examination on producing evidence :—

1. Of having been in possession of a registrable qualification in Medicine, Surgery, and Midwifery during not less than two years, of being registered by the General Medical Council, and of having completed the curriculum for the Diploma extending over a period of 12 calendar months subsequent to the attainment of a registrable qualification.

2. Of having attended, after obtaining the registrable Qualification, instruction during not less than 80 hours at an Institution recognised by the Examining Board in England in the following subjects :—(*a*) The Principles of Public Health and Sanitation for not less than 30 hours; (*b*) Epidemiology and Vital Statistics for not less than 20 hours; (*c*) Sanitary Law and Administration (including Public Medical Services) during not less than 20 hours; (*d*) Sanitary Construction and Planning during not less than 10 hours.

3. Of having attended for three months the clinical practice of a hospital for infectious diseases recognised by the Examining Board in England and of having therein received instruction in the methods of administration. The certificate must state that the candidate has attended on one or more days in each week of the three months, that each attendance was of two hours' duration, with a total attendance of 60 hours.

4. Of having been engaged during a period of not less than six months in acquiring a practical knowledge of the duties, routine and special, of public health administration under the supervision of a Medical Officer of Health, and of having received, from such officer or other competent Medical Officer during not less than three hours on each of 60 working days, practical instruction in those duties and also those relating to: (*a*) Maternity and Child Welfare Service; (*b*) Health Service for children of school age; (*c*) Venereal Diseases Service; (*d*) Tuberculosis Service; (*e*) Industrial Hygiene; (*f*) Inspection and Control of Food; including meat and milk.

The above certificate (4) must be obtained from a Medical Officer of Health who devotes his whole time to public work, or from a Medical Officer of Health of a Sanitary Area having a population of not less than 50,000, or in Ireland the Medical Superintendent Officer of Health of a County or County Borough having a population of not less than 50,000.

University of Oxford.—An examination, conducted partly in writing, partly vivâ voce, and in each subject partly practical, is held in Michaelmas and in Trinity Term in the following subjects :—General Hygiene, General Pathology (with special relation to Infectious Diseases), the Laws relating to Public Health, Sanitary Engineering, Vital Statistics. The examination is in two parts, which may be taken together or separately; but Part I. must be passed either before or at the same examination as Part II.

The First Part of the examination will comprise (*a*) written papers of three hours each in (i.) Chemistry and Physics, and (ii.) Pathology and Bacteriology; (*b*) a three hours' practical and vivâ voce examination in Chemistry and Physics; (c) a three hours' practical and vivâ voce examination in Pathology and Bacteriology.

The Second Part of the Examination will consist of the following parts :—(*a*) Two written papers, each of three hours, dealing with General Hygiene (including Sanitary Engineering, Vital Statistics, and the Laws relating to Public Health); (*b*) a practical and vivâ voce examination in General Hygiene; and (*c*) a three hours' practical and vivâ voce examination in Pathology and Bacteriology.

Candidates in Part I. of the examination will be required to produce certificates (1) of Laboratory Work in Chemistry, Physics, Meteorology, and Climatology as applied to Hygiene, and (2) of having had Practical Instruction in Bacteriology and Parasitology and the Pathology of the Diseases of Animals transmissible to Man.

Candidates in Part II. will produce the following further certificates: (3) of a Practical Knowledge of the Duties, Routine and Special, of Public Health Administration; and (4) of having attended the practice of a Hospital for Infectious Diseases at which opportunities are afforded for the study of the Methods of Administration.

All the above degrees are now open to Women Students, and particulars of Scholarships and Prizes may be obtained from the Principals of the various Ladies' Colleges. The names of candidates for the Diploma in Public Health must be sent to the Assistant Registrar of the University, Clarendon Building, Oxford. Applications for any further information should be addressed to the Dean, Department of Medicine, Museum, Oxford.

University of Cambridge.—Two examinations in so much of State medicine as is comprised in the functions of medical officers of health are held during the year. The examination is divided into two parts and demands proficiency in all the branches of study which bear upon the duties of medical officers of health. The examinations in both parts will be oral and practical, as well as in writing. Candidates may present themselves for either part separately or for both together at their option; but the result of the examination in the case of any candidate will not be published until he has satisfied the examiners in both parts. Marks of distinction will be placed against the names of candidates who have specially distinguished themselves in either (1) Part I. of the examination; or (2) Part II. of the examination. Candidates must before admission to either part of the examination produce evidence of having satisfied the regulations applicable to Part I. and Part II. The examination for Part I. is in April and for Part II. in October.

For Part I. of the examination courses of lectures and laboratory instruction are given in the University on Hygiene; Chemistry, &c., and on Bacteriology and Parasitology. For Part II. the Medical Officer of Health for Cambridge gives courses on Practical Sanitary Administration and in the Administrative Methods of the Infectious Diseases Hospital; and the Medical Officer of Health to the Cambridgeshire County Council, on Sanitary Laws, School Hygiene, Epidemiology. There are also courses by special lecturers in Vital Statistics, Tuberculosis Service, Venereal Diseases Service, Industrial Hygiene, Maternity and Child Welfare. These courses are open to non-members of the University.

A special Diploma in Hygiene is granted to medical graduates whose qualifications are not registrable in England. The courses and examinations are the same as for the Diploma in Public Health (except that the candidates are not examined in English Sanitary Laws).

All applications for further information respecting examinations and the courses of study should be addressed to Mr. Purvis, Public Health Chemical Laboratory, Cambridge.

University of London.—Candidates for the M.D. Degree may offer State Medicine as a subject in which to graduate. The regulations have been revised and may be obtained on application to the Academic Registrar, University of London, South Kensington.

University of Durham.—The Degree of Bachelor of Hygiene (B.Hy.) and the Diploma in Public Health (D.P.H.).—No candidate is admitted to the final examination for the Degree of B.Hy. unless he is a Bachelor of Medicine and Surgery, of not less than two years' standing, of a recognised University whose degrees are registrable on the books of the General Medical Council of the United Kingdom, and no candidate is admitted to the final examination for the D.P.H. unless he is a registered medical practitioner, of not less than two years' standing. The course of study for the B.Hy. and D.P.H. extends over a period of not less than 12 calendar months, subsequent to the attainment of a qualification registrable by the General Medical Council of the United Kingdom. Candidates for the B.Hy. must attend this course at the University of Durham; candidates for the D.P.H. may attend it at the University of Durham, or at any medical school or institution which is recognised by the University. The examination for the diploma or degree is divided into two parts. A candidate must pass in all the subjects of Part I. before being admitted to examination for Part II. In Part I., and also in Part II., a candidate must pass in all the specified subjects at one time. The examination for Part I. is practical, written, and oral, and includes the following subjects: Bacteriology and Parasitology (including medical entomology); Chemistry and Physics, and Meteorology and Climatology, in relation to Public Health. Candidates are not admitted to examination for Part I. until after they have completed the prescribed courses of instruction in the subjects thereof. The examination for Part II. includes Hygiene and Sanitation (comprising sanitary construction), Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. The examination is written and oral, and includes practical examinations in Infectious Diseases, Food Inspection, Inspection of Premises—Dwellings, Factories, Workshops, Schools, &c. Candidates are not admitted to examination for Part II. until after they have completed the prescribed courses of instruction in the subjects thereof. Doctor of Hygiene (D.Hy.): Candidates must be Bachelors of Hygiene of the University of two years' standing, and are required to satisfy the examiners that they have conducted original research in the subject of Public Health.

Victoria University of Manchester.—An examination in Public Health is held twice yearly. The examination is in two parts and is written, oral, and practical. Candidates may present themselves for Parts I. and II. separately or at the same time provided that no candidate be admitted to Part II. unless he has already passed in Part I. No candidate's name will be published until he has satisfied the examiners in both parts of the examination. Every candidate who has passed both parts of the examination to the satisfaction of the examiners, and who is legally registered, will receive a Diploma in Public Health. The examination will begin about the middle of July and the middle of October in each year. Holders of the Diploma in Public Health are eligible for examination for the Certificates in School Hygiene and Factory Hygiene after attending the prescribed periods of study and hospital practice. An examination for a Diploma in Bacteriology is held for graduates in science or medicine who have attended prescribed courses for at least one academic year; candidates must present a satisfactory thesis on an approved subject.

University of Birmingham.—Under the revised rules and regulations of the General Medical Council the University grants a degree of B.Sc. in Public Health and also a Diploma in the same subject on the following conditions: Graduates in Medicine of this University may become candidates for the degree of Bachelor of Science in Public Health by conforming to all the requirements laid down for candidates for the Diploma in Public Health, except that after graduating in Medicine all courses of study must be taken out in the University, and they must, in addition, have attended a three months' course of Geology in the University. A Thesis on the Ætiology and Prevention of a Disease of which the candidate has made a special study must be submitted on entry for B.Sc. Part II. The examinations will be held in the months of March and October, and will consist of two parts, each part being written, oral, and practical. No candidate will be allowed to pass Part II. until he has passed Part I. Candidates may enter for Parts I. and II. separately or at the same time. The fee for each part of the examination is £6 5s. Medical Officers of the Royal Navy who have attended the required course of study at the Naval Medical School, Greenwich, will be admitted to Part I. examinations for the Diploma in Public Health, whether they have previously been students at the Birmingham School or not; and the same applies to officers of the Royal Army Medical Corps who have studied at the Staff College. Medical Officers of the Navy and Army are admitted to Part II. Examination (D.P.H.) on complying with the requirements laid down for attendance upon Courses of Study. These Courses need not necessarily be attended in the University of Birmingham.

University of Liverpool.—The University grants a Degree in Hygiene (M.H.) and a Diploma (D.P.H.), and every facility is afforded for training in Sanitary Science and State Medicine. The curriculum for the Degree extends over a period of two years, the first of which is devoted to laboratory instruction and practical classes (including those for the Diploma); the second being devoted to advanced study and research. The courses may be taken at any time, and students are allowed to work daily in the laboratories.

University of Leeds.—The University grants a Diploma in Public Health, and every facility is afforded for training in Sanitary Science and State Medicine. The examination, which is held twice in each year—namely, in June and December—is in two parts, and is written, oral, and practical. Candidates must pass in Part I. before being admitted to Part II. Instruction in Entomology and Meteorology is given in the first term, and in Sanitary Chemistry and Bacteriology in the second and third terms. Practical work under arrangement with the Leeds City Council. Prospectus can be obtained from the Academic Sub-Dean of the Medical School.

University of Bristol.—Diploma in Public Health. Candidates must be at least 23 years of age, shall be fully registered medical practitioners of not less than two years' standing as such, and shall have passed the examination prescribed by regulations, which can be obtained from the Registrar upon application.

University of Wales.—Candidates for the Diploma in Public Health, the curriculum for which extends over a period of not less than twelve calendar months subsequent to the attainment of a registrable qualification, must produce evidence of having attended for not less than five months at the Welsh National School of Medicine or at an institution approved by the Court, practical instruction in Bacteriology and Parasitology, Chemistry and Physics, and Meteorology and Climatology in relation to Public Health. Candidates must also satisfy the examiners that they have received instruction approved by the University in the Principles of Public Health and Sanitation, Epidemiology and Vital Statistics, Sanitary Law and Administration, and Sanitary Construction and Planning. The candidate must also produce evidence that he has attended for three months on the clinical practice of a hospital for infectious diseases containing not less than 100 beds, and has received therein instruction in the methods of administration, and that he has for a period of not less than six months been engaged in acquiring a practical knowledge of the duties, routine and special, of a public health administration under the supervision of a medical officer of health. The examination for the diploma is divided into two parts, Part I. and Part II., each of which extends over not less than two days. A candidate must pass in all the subjects of Part I. before being admitted to Part II. of the examination. In Part I., and also in Part II., a candidate must pass in all the specified subjects at one time. Part I. of the examination is practical, written and oral, and comprises Bacteriology and Parasitology (including Medical Entomology); Chemistry and Physics, and Meteorology and Climatology in relation to Public Health. Candidates may not be admitted to Part I. of the examination until they have been certified as having pursued the prescribed courses of instruction in the subjects thereof. Part II. of the examination, which is written and oral, comprises: Hygiene and Sanitation (including Sanitary Construction); Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. No candidate can be admitted to Part II. of the examination until after the lapse of not less than two years from the date of his obtaining a registrable qualification in Medicine, Surgery, and Midwifery, which qualification must be registered before admission to Part II. of the examination. An examination in each part will be held annually. The examination in Part I. will be held in June, that in Part II. in October. Full information from the Registrar of the University, University Registry, Cathays Park, Cardiff, not later than May 15th for the examination in Part I. and not later than Sept. 1st for the examination in Part II.

University of Edinburgh.—Candidates for the Diploma in Public Health must be graduates in medicine and surgery of the University, or hold corresponding degrees or registrable medical qualifications which must be registered before admission to examination. The course is divided into two parts for which examinations are held twice yearly, in March and July for Part I., and in October and March for Part II. In each part the candidate must pass in all the specified subjects at one examination. Candidates are not admitted to Part II. until they have passed Part I., nor until after the lapse of not less than two years from the date of obtaining a registrable medical qualification. The subjects of the examination are: Part I. (written, oral, and practical), Bacteriology; Medical Entomology and Parasitology; Chemistry, Physics, Meteorology, and Climatology. Part II. (written, oral, and practical), Hygiene, Sanitation, and Sanitary Construction; Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. There is also included practical examinations in Infectious Diseases, Food Inspection, and Inspection of Premises. The course, which extends over a period of 12 calendar months, begins in October, and provision is made by the University for instruction in all the subjects. Detailed particulars may be obtained from the Dean of the Faculty of Medicine.

University of Aberdeen.—Every candidate for the Diploma in Public Health must be a graduate in medicine of the University of Aberdeen, or of any other University whose medical degrees are recognised as qualifying for registration by the General Medical Council of the United Kingdom. No candidate will be admitted to the Final Part of the Examination for the Diploma until after the lapse of not less than two years from the date of his obtaining a registrable qualification in Medicine, which qualification shall have been registered before such admission. The whole of the prescribed curriculum of study must be undertaken after the candidate has obtained a registrable qualification in medicine, and shall extend over not less than twelve calendar months. At least one academic term must be spent at the University of Aberdeen. Every candidate shall produce evidence of having complied with the following requirements in respect of study and training:—1. Practical instruction in the following subjects within a laboratory or laboratories approved by the University: (*a*) Bacteriology and Parasitology (including Medical Entomology), in relation to diseases of man and diseases of lower animals transmissible to man—at least 180 hours, of which not less than 150 shall be occupied in practical laboratory work; (*b*) Chemistry and Physics, in relation to Public Health—at least 90 hours, of which not less than 70 shall be occupied in practical laboratory work; (*c*) Meteorology and Climatology, in relation to Public Health—at least 10 hours; such instruction to extend over not less than five months or two academic terms. 2. A course or courses of instruction extending over not less than 80 hours dealing with: (*a*) The Principles of Public Health and Sanitation—30 hours; (*b*) Epidemiology and Vital Statistics—20 hours; (*c*) Sanitary Law and Administration (including Public Medical Services)—20 hours; (*d*) Sanitary Construction and Planning—10 hours; such course or courses to be given at an institution or by a teacher or teachers approved by the University. 3. Practical instruction, clinical and administrative, within a recognised hospital for general infectious diseases; such instruction to extend over three months, and to include 30 daily attendances of not less than two hours in each week. 4. Practical instruction and experience, during not less than six months (including attendance of at least three hours on each of sixty working days) in the duties, routine and special, of public health administration, under the supervision of a medical officer of health, who shall certify that the candidate has received from this officer or other competent medical officer, practical instruction in these duties, and also in those relating to: (*a*) Maternity and Child Welfare Service; (*b*) Health Service for Children of School Age; (*c*) Venereal Diseases Service; (*d*) Tuberculosis Service; (*e*) Industrial Hygiene; (*f*) Inspection and Control of Food, including meat and milk. The medical officers of health recognised for this purpose by the General Medical Council are: (*a*) a medical officer of health who devotes his whole time to public health work; or (*b*) the medical officer of health of a sanitary area having a population of not less than 50,000; or (*c*) in Ireland, the medical superintendent officer of health of a county or county borough having a population of not less than 50,000. The examination for the diploma is divided into two parts, each of which extends over not less than three days.

University of Glasgow.—Degree of B.Sc. in Public Health.—Candidates must be graduates in Medicine of a University of the United Kingdom, or of some other University recognised for the purpose by the University Court. Candidates must produce evidence (1) that, after they have obtained a registrable Degree in Medicine, a period of not less than two years has elapsed; (2) that, after they have obtained a registrable degree in Medicine, they have, during a period of not less than 21 calendar months, pursued the course of work and instruction prescribed, and have satisfied the examiners in the prescribed examinations. There are two examinations. Part I. includes the following subjects: (i) Bacteriology and Parasitology (including Medical Entomology); (ii) Chemistry and Physics in relation to Public Health; (iii) Meteorology and Climatology in relation to Public Health; (iv) Higher Chemistry in relation to Public Health; (v) Physics and Geology. A candidate must pass in the subjects marked (i), (ii), and (iii) of Part I. at one examination. Part II. includes the following subjects: (vi) Hygiene and Sanitation (including Sanitary construction); (vii) Epidemiology and Infectious Diseases; (viii) Sanitary Law and Vital Statistics; (ix) Public Health Administration; (x) Applied Hygiene. The examination for Part II. includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises, such as dwellings, factories, workshops, schools, and the like. The examination in Applied Hygiene may be on a selected subject professed by the candidate. A candidate must pass in the subjects marked (vi), (vii), (viii), and (ix) of Part II. at one examination. *Diploma in Public Health (D.P.H.).*—Candidates for this Diploma must be legally qualified medical practitioners who are matriculated students of the University. A period of not less than two years must elapse between the attainment by the candidate of a registrable medical qualification, and his admission to the final examination (Part II.) for the Diploma. The candidate must, during a period of not less than 12 calendar months, subsequent to his attainment of a registrable medical qualification, pursue the course of work and instruction prescribed, and pass the prescribed examinations. The examination, which is both written and oral, is divided into two parts, Part I. and Part II., each of which extends over not less than two days. No candidate is admitted to either part of the examination until he has completed the prescribed courses of instruction in the subjects of that part. No candidate is admitted to Part II. until he has passed in all the subjects of Part I., nor until after the lapse of not less than two years from the date of his obtaining a registrable medical qualification, nor unless he presents a certificate showing that his name and qualification have been duly registered in the Medical Register. Part I. includes: (i) Bacteriology and Parasitology (including Medical Entomology); (ii) Chemistry and Physics in relation to Public Health; (iii) Meteorology and Climatology in relation to Public Health. A candidate must pass in all the subjects at one examination. Part II. includes: (iv) Hygiene and Sanitation (including Sanitary Construction); (v) Epidemiology and Infectious Diseases; (vi) Sanitary Law and Vital Statistics; (vii) Public Health Administration. A candidate must pass in all the subjects at one examination. The examination for Part II. includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises, such as dwellings, factories, workshops, schools, and the like.

University of St. Andrews.—The Diploma in Public Health is open to those who hold a registered medical qualification of the United Kingdom. The examination is in two parts. (1) (*a*) Bacteriology and Parasitology; (*b*) Chemistry and Physics; (*c*) Meteorology and Climatology. (2) Public Health and Sanitation, Epidemiology and Vital Statistics, Sanitary Law and Administration, and Sanitary Construction and Planning. Before admission to the first examination the candidate must have held his medical qualification for one year, and before admission to the second examination for two years. Graduates in Medicine of the University of St. Andrews may take part or all of the qualifying classes in any University of the United Kingdom, or in any Indian, Colonial, or Foreign University or medical school recognised by the University Court, but holders of other registered medical qualifications must spend at least eight out of the 12 months' curriculum in St. Andrews University. A complete course is given in the Conjoint Medical School, Dundee. The examination fee for each division is £5 5*s*.

University of Dublin (Trinity College).—The Diploma in Public Health is conferred, after examination, under the following conditions. The candidate must be a registered medical practitioner and have obtained a registrable qualification at least two years before the second part of the examination. The candidate must have completed, subsequently to obtaining a registrable qualification, five months' practical instruction in a chemical and bacteriological laboratory, or laboratories, approved by the University, must have received instruction in the following subjects: the principles of public health and sanitation, epidemiology and vital statistics, sanitary law and administration (including public medical services), sanitary construction and planning; must have studied practically, outdoor sanitary work for six months under an approved officer of health, and must have attended for three months at a fever hospital where opportunities are afforded for the study of methods of administration. A special prospectus may be obtained by application to the Registrar of the School of Physic, Trinity College, Dublin.

*National University of Ireland.**—At this University there is a Diploma in Public Health, a B.Sc. in Public Health, and a D.Sc. in Public Health.

University of Belfast.—A Diploma in Public Health is given by examination. Every candidate must produce evidence that, after obtaining a registrable qualification, he has during six months received practical instruction in an approved laboratory in which Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man are taught. After obtaining a registrable qualification every candidate must produce evidence that he has attended during three months the practice of a hospital for infectious diseases at which opportunities are afforded for the study of methods of administration. The examination must have extended over not less than four days, one of which shall have been devoted to practical work in a laboratory, and one to practical examination in, and reporting on, subjects which fall within the special outdoor duties of a medical officer of health. The first part of the examination will have reference to the general principles of Sanitary Science and the second part to State Medicine and to the applications of Pathology and Sanitary Science. The examination in both parts is held twice a year, in March and June.

Royal College of Physicians of Edinburgh, Royal College of Surgeons of Edinburgh, Royal Faculty of Physicians and Surgeons of Glasgow.—All candidates for the Diploma in Public Health must have a qualification which has been registered under the Medical Acts. Candidates must have attended not less than four calendar months' practical instruction in Chemistry and Physics (90 hours), Bacteriology and Parasitology (180 hours), and Meteorology and Climatology (60 hours) in a recognised laboratory or laboratories, must have studied outdoor sanitary work for six months under a medical officer of health or other sanitary officer; and must give evidence of attendance for three months at the practice of a Hospital for Infectious Diseases, at which he has received instruction in the methods of administration. The examination consists of two parts, and candidates may enter for both at one period or for either separately. The First Part includes (*a*) Laboratory Work (Chemistry and Bacteriology), (*b*) Physics and Meteorology; and the Second Examination embraces (*a*) Report on Premises visited, (*b*) Examination at Fever Hospital, (*c*) Examination at Public Abattoir, (*d*) Written and Oral Examinations on Epidemiology and Endemiology, (*e*) Vital Statistics and Sanitary Law, and (*f*) Practical Sanitation. The fee is 12 guineas for both examinations, or 6 guineas for either of them. A fee of 3 guineas is payable by rejected candidates for either examination. The examination is held twice yearly, in May in Glasgow, and October in Edinburgh. The published regulations provide detailed synopses of the subjects of examination. *The curriculum and examination have been adjusted fully to meet the requirements of the regulations of the General Medical Council which came into force on Jan. 1st, 1924.* Candidates applying for Regulations should state date of commencement of curriculum. The Registrar for Edinburgh is Mr. D. L. Eadie, 49, Lauriston-place, and for Glasgow Mr. Walter Hurst, 242, St. Vincent-street.

Royal College of Physicians of Ireland and Royal College of Surgeons in Ireland.—Every candidate for the Diploma in Public Health must observe the following rules: 1. A period of not less than two years shall elapse between the attainment by a candidate of a registrable qualification in Medicine, Surgery, and Midwifery, and his admission to the Final Examination for a Diploma in Public Health. 2. The curriculum for a Diploma in Public Health shall extend over a period of not less than 12 calendar months subsequent to the attainment of a registrable qualification. 3. Every candidate shall produce evidence of having attended, during a period of not less than five months, at an institution approved by the Licensing Body granting the Diploma, practical instruction in—(*a*) Bacteriology and Parasitology (including Medical Entomology), especially in their relation to diseases of man, and to those diseases of the lower animals which are transmissible to man; (b) Chemistry and Physics in relation to Public Health; (c) Meteorology and Climatology in relation to Public Health. At least 180 hours must be devoted to Course (a), of which not less than 150 hours shall be occupied in practical Laboratory work. At least 90 hours must be devoted to Course (b), of which not less than 70 hours shall be occupied in practical Laboratory work. At least 10 hours must be devoted to Course (c). 4. Evidence of having received, during not less than 80 hours, at an institution or from teachers approved by the Licensing Body granting the Diploma, instruction in the following subjects: (a) The Principles of Public Health and Sanitation; (b) Epidemiology and Vital Statistics; (c) Sanitary Law and Administration (including Public Medical Services); (d) Sanitary Construction and Planning. 5. Evidence that he has attended for three months on the clinical practice of a recognised Hospital for Infectious Diseases. 6. Evidence that he has, during a period of not less than six months, been engaged in acquiring a practical knowledge of the duties, routine and special, of Public Health Administration under the supervision of a Medical Officer of Health. The examination for the Diploma is divided into two parts. The examination for Part I. includes Bacteriology and Parasitology (with Medical Entomology); Chemistry and Physics, and Meteorology and Climatology, in relation to Public Health. The examination for Part II. includes Hygiene and Sanitation (with Sanitary Construction); Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. The examination, which is written and oral, includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises—dwellings, factories, workshops, and schools.

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* No returns.

DENTAL SURGERY.

REGISTRATION on the Medical Register entitles a practitioner to practise as a dentist, although he cannot register as such without degree or licence in dentistry; but few dental appointments at general or special hospitals or dispensaries are available save to those with a special diploma, and until registered on the Dentist Register, no dental work under the Additional Benefit Scheme of the National Health Insurance Act can be undertaken.

The Examining Bodies in Dentistry which grant degrees and diplomas in the subject are as follows: Royal College of Surgeons of England, Royal College of Surgeons, Edinburgh, Royal Faculty of Physicians and Surgeons of Glasgow, Royal College of Surgeons in Ireland, and the following Universities: Birmingham, Bristol, Durham, Leeds, Liverpool, London, Manchester, Sheffield, St. Andrews, Dublin (Trinity College), Queen's University of Belfast, and the National University of Ireland. The respective requirements of the various examining bodies in dentistry are very similar, being designed to meet the requirements of the General Medical Council, but the examinations vary in stringency, and each school has its rules for matriculation and exemption, and its scale of fees. The student should apply to the secretaries of the various Conjoint Boards or to the Deans of the medical faculties or medical schools for a syllabus.

TEACHING INSTITUTIONS IN DENTISTRY: LONDON.

Royal Dental Hospital of London, School of Dental Surgery. Leicester-square.—A school of the University of London. Women are admitted as students and are eligible for all hospital appointments and school prizes. The school provides the special dental education required by the Royal College of Surgeons for the Licence in Dental Surgery. The general part of the curriculum may be taken at any general hospital. The hospital is open from 9 A.M. to 5 P.M., there being one staff for the morning and another for the afternoon of each day. Pupils are received for the training in dental mechanics recognised by the curriculum. The instructors at the commencement of each session give a course of lectures on Operative Dental Surgery. The five house surgeoncies are held for six months each and are open to all qualified students. The lecturers, in addition to their lectures, give special demonstrations on the Microscopy of Dental Anatomy and Dental Surgery. The lecturer on Dental Mechanics also gives practical demonstrations in the laboratory. There is an Entrance Scholarship in Chemistry and Physics of the value of £25. One Entrance Scholarship in Dental Mechanics and Metallurgy, value £25, open to pupils of the Hospital only. Prizes and certificates are awarded by the lecturers for the best examinations in the subjects of their respective courses at the end of the summer and winter sessions. For full information as to scholarships and prizes, and other matters connected with the course, application should be made to the Dean.

University College Hospital Dental School, corner of Great Portland and Devonshire-streets, W.—This Hospital and School has recently been thoroughly reorganised, and is now fully equipped with all the most modern appliances. Students are entered as students of University College Hospital, and, as such, attend the classes of Anatomy and Physiology in University College, which is a few minutes' walk from the Dental Department in Great Portland-street, hitherto known as the *National Dental Hospital,* the first Dental School to admit Women Students. Practical courses to comply with the R.C.S. curriculum are held. Clinical Lectures and Demonstrations are given, and each student on entering passes through a preliminary course under a demonstrator. A prospectus containing full information as to lectures, fees, and prizes may be had on application to the Sub-Dean for Dental Students, who attends at University College Hospital Medical School, University street, W.C.1, on Wednesday mornings from 9.30 to 10.30, and at other times by appointment.

Guy's Hospital Dental School.—The work of the Dental Department begins daily at 9 A.M. both in the extraction rooms and in the conservation room. The Extraction Rooms: There is ample accommodation for both general and local anæsthetic extractions, together with waiting- and retiring-rooms. Patients are admitted between 8.45 and 9.30 A.M., and are seen by the dental surgeon for the day, the staff demonstrators, the dental house surgeons, and the dressers. The Conservation Room is open from 9 A.M. till 5 P.M. It affords accommodation for about 100 dental chairs, with the necessary equipment of the most modern type for the use of the Dressers, who, under the supervision of the Staff, perform the various operations of Dental Surgery. There is a separate room for denture patients affording accommodation for 15 chairs and a separate department for children with accommodation for 20 chairs. The Members of the staff attend every morning and afternoon to give demonstrations and otherwise assist students in their work in the Conservation Room and Prosthetic Laboratory. The Probationers' Laboratory is supervised by three of the staff demonstrators, and instruction is given in operative dentistry on a "mannikin" to students during their first three months of clinical study. Students in Dental Prosthetics are received, and a graded, systematic, and full course of instruction, extending over two years, is carried out under the supervision of the Director of the Prosthetic Laboratory, assisted by two demonstrators, a house surgeon, and five mechanics.

Dental students have the opportunity of attending at this hospital the whole course of instruction required by the examining board for the B.D.S. Lond. or L.D.S. Eng.—viz., the complete course in dental prosthetics, the special lectures and practice of the Dental Department, and the general lectures and practice of the Medical School. The fees for these two courses may be paid separately or together, or they may be combined with the fees required to be paid for the course for a medical diploma. Students who enter for a medical as well as a dental diploma are allowed to pursue their study of Dentistry during any period of their medical course most convenient to themselves without further charge.

Twelve house surgeons, 20 assistant house surgeons, and four student demonstrators of Dental Histology are appointed annually. The following appointments are held by students: Full surgeon's dresser, assistant surgeon's dresser, dresser in the children's department, casualty dresser, clerk to the anæsthetist, dresser in the gas extraction and local anæsthetic extraction rooms, and probationary dresser. For particulars as to scholarships and prizes, as well as all information, application should be made to the Dean of the Medical School, Guy's Hospital, London Bridge, S.E. 1.

King's College Hospital.—The Dental School is part of the Medical School of King's College Hospital, and was opened in November, 1923. The Dental Out-patient Department of the Hospital is used for the performance of dental extractions. A large Conservation Room with provision for 40 dental chairs has been equipped. Smaller rooms are used for clinical teaching and administrative requirements, and a specially equipped laboratory for training in the art of dental mechanics. An X ray apparatus has been installed for special use in dental skiagraphy. A museum containing a large number of specimens illustrating oral, buccal, dental, and other diseases is available for teaching purposes. The library, lecture theatre, lecture rooms, common rooms, and the refreshment room are all available for the use of students. Courses of study, including practical work, are provided for the degree of Bachelor of Dental Surgery of the University of London, and for the Diploma in Dental Surgery of the Royal College of Surgeons of England. Special arrangements are made for those students who wish to take a medical degree or qualification in addition to a degree or diploma in Dental Surgery.

The following salaried appointments are open to qualified members of the School: Registrar, Resident House Surgeon, Non-Resident House Surgeon, and Tutor in Dental Mechanics.

Full particulars of the Dental School may be obtained on application to the Dean, or to the Secretary of the Medical School, King's College Hospital, Denmark Hill, London, S.E.

London Hospital.—This school is a part of the London Hospital and Medical College, and is fully equipped on the most modern lines and with the latest appliances. It provides a complete curriculum in all subjects for the B.D.S. Degree and for the L.D.S. Diploma, and is admirably adapted for the purpose of teaching. The Conservation Room is well lighted and ventilated and fitted with pump chairs of the latest pattern; the fountain spittoons at many of the chairs have been specially designed. Each spittoon has attached to it a saliva ejector, hot and cold water, compressed air, gas and electric current, also a swing bracket to carry the students' cabinet. Electric sterilisers are supplied in each department and motor engines where required. The School possesses, in addition to the Theatres, Laboratories, and Museums in the College, a special Museum of Dental Anatomy and Surgery, Operative Dentistry, Prosthetic and Extraction Rooms, and Laboratories for Practical Metallurgy and Prosthesis. A systematic course of instruction is arranged for pupils. The up-to-date Laboratory contains every modern apparatus and is in charge of a skilled curator and his assistants. Connected with the Medical College and Dental School are a Library, Athenæum, Clubs' Union, Dining Hall with moderate tariff, Students' Hostel, and an Athletic Ground. For full particulars as to Scholarships and Prizes, fees and course of study advised, apply to the Dean of the Medical School.

London (Royal Free Hospital) School of Medicine for Women.—Full courses are arranged for women students in conjunction with the Royal Dental Hospital, Leicester-square, for the study of dentistry; and in preparation for the B.D.S. Degree of the University of London and the Licence in Dental Surgery of the Royal College of Surgeons of England, at the London (Royal Free Hospital) School of Medicine for Women.

TEACHING INSTITUTIONS OUTSIDE LONDON.

Birmingham Dental Hospital, Great Charles-street.—Dean: Cyril Howkins, C.B.E., D.S.O., M.R.C.S., L.D.S. The Dental Hospital has accommodation for 100 students. The equipment is in accordance with the most modern requirements for the efficient teaching and practice of Dental Surgery, including Radiology and Ultra-Violet Ray Therapy and a new department for Practical Pathology and Bacteriology. The operations performed annually average 35,000, including gold and other fillings, crowns, bridges, porcelain inlays, and injections for block and infiltration anæsthesia. The orthodontic department is one of the foremost in the country. The Prosthetic and Mechanical Department is large and well lighted and under a highly skilled instructor who is always present. Application for information as to fees and scholarships must be sent to the Dean of the Medical Faculty, Birmingham University, or the Dean of the Dental Hospital, Birmingham.

Leeds University School of Dentistry.—The School of Dentistry is adequately equipped to provide for the complete training of the dental student. It forms a part of the Leeds School of Medicine whilst the instruction in clinical and mechanical dentistry is carried out in the Dental Hospital. The School is now in occupation of a spacious new building especially designed to the requirements of modern dental teaching. The School is also the dental department of the General Infirmary, and its close association with the work of that institution ensures an adequate supply of clinical material, and enables a fuller insight into the position dental surgery holds in relation to general medicine and surgery, especially with regard to the major diseases and injuries of the head and neck. The courses of study are mainly designed to meet the requirements of the B.Ch.D. and L.D.S. Leeds, but every opportunity is afforded to students preparing for the degrees or diplomas of other licensing bodies. Full-time demonstrators give the instruction in clinical dental surgery, prosthetic dentistry, and mechanics, which is carried out under the supervision and direction of members of the Honorary Staff, two of whom are in attendance each day. Special facilities are provided for instruction in Orthodontia, Dental Radiography, Local and General Anæsthetics. Prizes are offered for competition to pupils and students in their respective years of study. Communications should be addressed to the Warden, School of Dentistry, Leeds, from whom a prospectus may be obtained.

Dental Hospital of Manchester.—This hospital is in association for teaching purposes with the University of Manchester and the Royal Infirmary, and is in the centre of a very large population. Courses of study are provided to meet the requirements of the various examining bodies, including those of the University of Manchester for the qualifications L.D.S. and B.D.S., and the L.D.S. of the Royal College of Surgeons of England. Clinical instruction is given in Dental Prosthetics, Operative Dentistry, Diagnosis and Extraction, Orthodontics, Dental Surgery, Radiography, and Anæsthetics by specially appointed Clinical Teachers.

All the courses of instruction are open to women students. Copies of the Prospectus will be forwarded on application to Mr. J. Hilditch Mathews, Dean.

Newcastle-upon-Tyne Dental Hospital and School.—This hospital is centrally situated (within five minutes of the various colleges, infirmary, and railway station);

the rooms are well lighted and thoroughly equipped for carrying on the work. Dental surgeons and an anæsthetist attend each morning. A tutorial dental surgeon and a prosthetic tutor are also in attendance. Medals and Certificates of Merit are granted to students showing certain standards of proficiency in the various classes at the Dental School. The prospectus of the Dental Hospital and School, containing full information, may be obtained from Mr. James Coltman, 13, Ellison-place, Newcastle-upon-Tyne, Dean.

Devon and Exeter Dental Hospital, 24, Southernhay West, Exeter.—The hospital is open on Mondays, Tuesdays, Wednesdays, Thursdays, Fridays, and Saturdays, and patients are admitted between the hours of 9.30 and 11 A.M. Students attend the practice of the hospital under the control of the medical officers.

SCOTTISH TEACHING INSTITUTIONS.

The Incorporated Edinburgh Dental Hospital and School.—The Edinburgh Dental Hospital and School is located in spacious and well-equipped buildings at 30, 31, and 32, Chambers-street, and offers special advantages to dental students. A large and important extension of the existing buildings has now been opened. The General Courses required for the Dental Diploma may be taken in the Medical School of the Royal Colleges of Physicians and Surgeons or in the University schools. The general hospital attendance and clinical instruction are taken at the Royal Infirmary. The University, Medical Schools, and Royal Infirmary are within three minutes' walk of the Dental Hospital. The special courses are taken in the hospital. The Dental Hospital practice, extending over two years, affords a student ample opportunity for a full acquaintance with every branch of dentistry. The hospital admits a limited number of indentured pupils. They receive their instruction in Mechanical Dentistry concurrently with the general and special courses. A premium of 60 guineas is payable with each such pupil. The practice and lectures of the hospital are recognised by, and qualify for, all the Licensing Boards. Those students who desire to take a Medical and Surgical Diploma in addition to the L.D.S. have in this school admirable facilities for so doing. The triple qualification of the Royal College of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow is recommended. The Higher Dental Diploma (H.D.D.) of the Royal College of Surgeons affords an opportunity of obtaining a higher qualification subsequent to registration. The Prospectus, with full information, may be obtained by application to the Dean or the Assistant Secretary.

Incorporated Glasgow Dental Hospital, 158, Renfrew-street and 15, Dalhousie-street, Glasgow.—The School is open to Men and Women Students, and Lectures are given on Dental Surgery, Operative Dental Surgery, Orthodontia, Dental Anatomy and Physiology, Dental Histology, Dental Mechanics, Crown and Bridge work, Dental Metallurgy, Dental Bacteriology, Radiology, Anæsthetics, and Dental Materia Medica. Lectures on general subjects required for Dentistry may be taken at the University or at one of the extra-mural schools where special provision is made for Dental Students. A new mechanical laboratory with bench accommodation for 60 pupils and fully equipped with the most modern appliances for teaching practical dental mechanics has recently been added. Full information may be had on application to the Dean.

Glasgow Royal Infirmary (Dental Department).—The following course in the curriculum can be taken at St. Mungo's College: Anatomy, six months; Practical Anatomy, nine months; Physiology, six months; Chemistry, six months; Practical Chemistry, three months; Surgery, six months; Medicine, six months; Materia Medica, three months; Dental Surgery, six months, and attendance for two years on the dental department of the hospital. Clinical Medicine (three months) and Clinical Surgery (six months) are taken at the Royal Infirmary.

IRELAND.

Incorporated Dental Hospital of Ireland, Lincoln-place, Dublin.—All Dental Students who have passed their Second Dental Examination in the Royal College of Surgeons in Ireland (or an equivalent examination or examinations) are admissible to the Clinical Instruction of the Hospital. In addition to Clinical Instruction and Special Demonstrations, courses of lectures are given at the hospital on Dental Surgery and Pathology, Mechanical Dentistry, the Administration of Anæsthetics, Orthodontia, Dental Anatomy, and Dental Materia Medica, and instruction in Anæsthetics. The course in practical Dental Mechanics can be taken in the Hospital Laboratory. Further particulars can be obtained from the Dean.

PRISON MEDICAL SERVICE.

CANDIDATES for the Prison Medical Service are approved by the Secretary of State for the Home Department on the recommendation of the Prison Commissioners. Preference is always given to candidates who have experience of lunacy. Application for employment may be made on a special form, which can be obtained from the Secretary, Prison Commission, Home Office, London, S.W. In the smaller prisons the medical officership is part-time, and is usually filled by practitioners in the locality, preference being given to those who have special experience of lunacy. In the large prisons the medical staff must devote their whole time to the Service. In the case of whole-time service, the appointment is in the first instance to the post of Medical Officer, Class II., and from the seniors of this rank the Medical Officers, Class I., are selected as vacancies occur. The pay of the whole-time prison medical staff is as follows: Medical Officer, Class II., £350, rising by annual increments of £20 to £600, making the pay at present with bonus £485 8*s.* to £776 7*s.*; Medical Officer, Class I., £650, rising by annual increments of £25 to £800, plus bonus, making the pay £837 5*s.* to £995 11*s.* Unfurnished quarters are provided or an allowance in lieu is made. Study-leave is granted annually to two of the whole-time Medical Officers. There are 12 full-time medical officers of Class I. and 15 Class II., and 23 part-time medical officers. The number of vacancies is never large and promotion is slow.

THE ELIZABETH GARRETT ANDERSON HOSPITAL.—Application for a Charter of Incorporation has been made by the Marchioness of Dufferin and Ava and others on behalf of the Elizabeth Garrett Anderson Hospital.

INTERNATIONAL MEDICAL POST-GRADUATE COURSES IN BERLIN.—In connexion with the Medical Faculty of Berlin post-graduate courses are held by the Lecturers' Association for Medical Continuation Courses and the Kaiserin Friedrich-Haus. The regular courses last from two to four weeks; other courses for those wishing to act as resident assistants in clinics, hospitals, and laboratories, lasting two to three months and longer, are arranged under systematic supervision. Courses will also be held next month as follows: Oct. 1st to 13th, General Survey of Medical Progress with Special Reference to Pulmonary Diseases; Oct. 8th to 20th, Nose, Throat, and Ear Course for Specialists; Oct. 15th to 27th, Pediatry. There will also be a course on New Methods of Diagnosis and Therapy, with practical clinical studies and exercises in the City Hospital, Friedrichshain, and its laboratories, as well as single courses in special fields of medical science, including practical work. The courses are held in German, but some of the professors speak English, French, and Spanish. Further information and details as to lodgings and so forth can be obtained from the Kaiserin Friedrich-Haus, Luisenplatz 2–4, Berlin, N.W. 6.

PUBLIC AUTHORITIES AND RESEARCH.*

BY JAMES M. BEATTIE, M.D. EDIN.,
PROFESSOR OF BACTERIOLOGY IN THE UNIVERSITY OF LIVERPOOL.

AT present there are a few public authorities which encourage research to a limited extent, but the great bulk of them do practically nothing, and research is largely financed by private individuals, or by universities and colleges which can ill afford the money. I do not forget the national effort in our Medical Research Council and what is done under the direction of the Ministry of Health and the Ministry of Agriculture. But the work of these ministries is restricted and greatly hindered by want of funds. Very often, before any substantial results are obtained, it is interrupted because the money voted is exhausted. The Medical Research Council also is hampered by financial considerations, and one sometimes wonders whether those under whose direction the work is done have really an absolutely free hand. Large organisations of this kind, whether supported by Government or by private associations with large committees, have of necessity to produce reports at stated intervals, and these reports must contain results of work done. Not uncommonly that work is unfinished and not thoroughly controlled; the investigators fully realise this, but the committee has to be satisfied, and the subscribers expect results for the money they have given.

Danger of Directing Research.

I think these large organisations have other decided disadvantages. It is a necessity that there should be someone directing the different branches of the research carried on. He may be a very able man, and he usually is. He forms his plan of investigation, and his workers having that plan before them pursue lines which lead to the central point in that plan. There is the one brain which dominates and the investigator must not follow side-tracks. Of all new information which comes to him during the course of his investigation, only that information can be accepted which seems to help him along the special track which has been chosen, and if the track is wrong then a new track has to be found, and months, and even years, of research have merely led to an impassable wall.

I do not underrate the value of such work—barren though the final result may be—but what I do deprecate is that by the establishment of central institutes there are only a limited number of tracks blazed. There are numbers of men who, given an opportunity, would see other roads, so that instead of one man planning a special line of attack there would be a dozen men possibly planning a dozen lines, with an increased probability of success. For this reason, but not for this alone, I would urge that research centres should be as widespread as possible.

Disadvantages of Research Institutes.

The research institute is generally divorced from the hospital, and it is almost inevitable that the clinical side of disease in the human subject should be ignored in favour of animal experiment. If progress is to be made it is, to my mind, essential that the hospital and the research department should be closely associated, and the research worker should, by preference, be a man with experience as a clinician. But in practice we find our research institutes staffed by young men—very often brilliant young men—who have just qualified and whose real experience of disease is extremely limited. Is it to be wondered at that much of what they do has little or no bearing on the problems of the everyday practice, and that the laboratory worker is becoming more and more a pure scientist, separated entirely from the clinician? Let me say, in passing, that the laboratory worker is not altogether to blame, for many clinicians show no desire to aid the pathologist or to give him any facilities for keeping in touch with the sick man. The research institute, I believe, helps in this separation; certainly there would be less tendency towards it if the research laboratory were intimately associated with a hospital, as most of our university laboratories are.

Again, it may be asked, is the money expended to the best advantage? I am not here concerned with places like the Rockefeller Institute, which have a hospital attached and where there is neither financial restriction nor an obligation on the research worker to show cause for his existence, but I refer rather to the ordinary research institute with its elaborate buildings and equipment. The administrative expenses are usually very heavy. Much of this expense could be avoided—or, at any rate, the money be more advantageously spent—if the workers were distributed over the various laboratories now in existence, and these research centres spread widely over the country.

Organisation versus Initiative.

We all rejoice in the present great national appeal for cancer research, but how will the money be used? A great research worker said to me a few weeks ago: "This appeal has killed cancer research."—"Why?" I asked. "Because we are out for something big," he answered, "something that will appeal to the people. The man who has been working quietly and steadily in his own laboratory—hampered, it is true, by want of funds—is likely to be absorbed into an institute; his initiative will be crushed because he has to work along a plan made by a director, and money which could be used to finance these individual workers will go to the ere[illegible] cancer hospitals—and to [illegible] This may be a pessimistic view, but it is one which demands our earnest consideration. I am still a believer in the individual worker, financed properly—one who uses his own brains, thinks out his own problems, and gets himself in touch with his fellow workers in the same field, and discusses with them his ideas. Team-work has been tried, but I venture the opinion that most men who have had experience of it are looking forward to the funeral rather than to the festival.

A contemporary writer speaks of the loss of efficiency consequent on "subjecting policy to the constant censorship of uninformed critics" as one of the evils of democratic government. This censorship and this criticism in research is one of the greatest evils of the committee system of directing it.

We have seen some evidence of this in the recent reports on cancer research. For instance, the very fact that public discussion of the lead treatment of cancer has been necessary at this stage is because the whole research on cancer has come under the auspices of a Committee which must publish its results in order to stimulate the public to raise more money. I say that such public discussion has done a great deal of harm to the progress of the research.

A Better Way.

If the local authorities will agree to give facilities in their various hospitals and institutions and the universities and colleges will place their laboratories and their trained staff at the disposal of these workers, then the thing, administratively, is accomplished. The administrative expenses would be small, as the laboratories at present in existence at the universities could be used and the head of the university department would supervise the work. Thus, there would be no expenses for building, and very little for apparatus and materials, and the supervising head would, I have little doubt, in most cases, if not in all, accept the responsibility without extra payment. The main payments would be to the research workers, and these should be paid by the local authorities. These research workers are, in my opinion, as much a necessity in the hospitals of the local authorities as the resident medical officers, but they must be men who have been trained, and they should have, at least, an equal status, financial and otherwise, with the senior resident medical officers. They must be closely in touch with the clinical work of the hospital and should have all the advantages of the senior medical officers, with whom they must be in constant collaboration.

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* Abridged from a presidential address delivered before the Section of Bacteriology, Pathology, and Biochemistry of the Royal Institute of Public Health at Dublin on August 15th.

Let me here say that I do not mean by research the ordinary routine examinations which so often constitute the work of the hospital pathologist, nor do I mean the ordinary class of work—often designated research—which is so often produced by the man whose sole object is to get a higher degree. I mean a real investigation which has for its object the solution of a problem which will throw some light on the cause or treatment of disease.

Collaboration of Universities.

Let me outline briefly what I consider should be done. In the first instance, that local authorities in the neighbourhood of a university town should appoint at least one qualified research assistant who would have free access to their hospitals and have at the same time the facilities of the university laboratories, and that the head of these departments should act as advisor to the research worker. Laboratory assistance would be necessary, as the research worker should not be required to do a lot of mechanical work which could be quite efficiently done by a partially trained man. I would put the maximum annual cost for each research worker at £1500 to cover salary, assistance, and material. With the appointment of a number of such workers the problems of disease would thus be attacked along different aspects by a series of workers, all sufficiently remunerated to go on for several years, and advised by men of different ideas and different lines of thought. They would have facilities of the best, and I am confident that in a very short time the expenditure of money would be fully justified. My contention is that with available funds it is far better to endow the individual effort than to endow an institute which has certain disadvantages.

The history of medicine goes to show that the greatest discoveries and the greatest advances have been made by workers who have worked along independent lines, and who have not been under the control of special research and other committees, always on the outlook for reports and publications. Incidentally, I would add that I think it would be a good thing if the scientific medical journals could be suppressed for a few years, so that much of the undigested literature of to-day might find its way into the waste-paper basket before, and not after, publication.

Research in our universities has been badly organised, hampered on all sides by want of funds and by the lack of hospital facilities. If the money spent on the bricks and mortar, on the equipment, and on the maintenance had been spent on university laboratories already built and already fairly well equipped, then it would have been more abundant and probably more valuable. Everyone must recognise that in a University the heads of departments are busy with teaching and administration, and research must take a second place, but universities should be sufficiently financed to be able adequately to staff their department so as to relieve the man with the special capacity for research from much of the routine administrative and teaching work of the department. I would not free him altogether from teaching, because I think the divorce of teaching and research is extremely bad, particularly for the teacher, and in a lesser degree for the research worker. The University, however, should be able to relieve the research man from much routine work by giving him satisfactory assistants, and at the same time to encourage the spirit of research among its younger teachers.

An Appeal to Local Authorities.

It may be asked whether this is legitimate work for the local authorities. To me it appeals as essentially their work. Research deals not only with the discovery of the cause of the diseases, but with the means of protection against them; the funds for this must come mainly from the national purse and from local authorities. I am not dealing to-day with research under Government control, but would merely say in passing that it is not creditable to our country the way research, in all its branches, is starved. My appeal to-day is to the enlightened local authorities, that they should devote a certain amount of money to systematic research in the laboratories established in their neighbourhood just as they devote money to the treatment of disease. What a stimulus would be given to research if our local authorities were to give even *one-tenth of the money they are now spending on* administration to existing research laboratories.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 11TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 111 (last week, 126); scarlet fever, 1334; diphtheria, 787; enteric fever, 222; pneumonia, 499; puerperal fever, 58; puerperal pyrexia, 90; cerebro-spinal fever, 12; acute poliomyelitis, 10; acute polio-encephalitis, 1; encephalitis lethargica, 14; continued fever, 1; dysentery, 4; ophthalmia neonatorum, 128. No case of cholera, plague, or typhus fever was notified during the week.

The following counties each notified three or more cases of enteric fever:—London, 69; Bucks, 3; Devon, 5; Essex, 9; Hertford, 3; Kent, 6; Lancaster, 13; Middlesex, 9; Northumberland, 3; Nottingham, 9; Southampton, 3; Surrey, 45; Warwick, 7; Wilts, 4; Yorks, West Riding, 6. The total of 222 includes 147 cases of paratyphoid fever, of which 57 were notified in London and 35 in Surrey.

The number of patients in the Infectious Hospitals of the Metropolitan Asylums Board on August 14th–15th was as follows:—Small-pox, 11 under treatment; scarlet fever, 1614; diphtheria, 1618; enteric fever, 97; measles, 226; whooping-cough, 207; puerperal fever, 12 (plus 9 babies); encephalitis lethargica, 71; poliomyelitis, 12; "other diseases," 15. At St. Margaret's Hospital there were 18 babies with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 5 (1) from enteric fever, 11 (1) from measles, 6 (1) from scarlet fever, 22 (2) from whooping-cough, 22 (5) from diphtheria, 60 (19) from diarrhœa and enteritis under two years, and 15 (3) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London were reported from Liverpool, Salford, Preston, and Sheffield. Of the 20 fatal cases of whooping-cough outside London 3 were reported from Birmingham and 2 each from Liverpool, Manchester, and Newcastle-on-Tyne. Glasgow reported 7 in the same week. Belfast reported 5 fatal cases of measles. The youthful deaths from diarrhœa show scarcely any increase.

The number of stillbirths registered during the week was 254 in the great towns (corresponding to a rate of 42 per thousand births), including 45 in London.

THE LATE COLONEL J. ARNOTT.—The death occurred on August 18th at Kirtlebridge, Dumfriesshire, of Lieut.-Colonel James Arnott, formerly of the Indian Medical Service. The son of Dr. John Arnott, he was born in India in 1845, and went back to the East soon after qualifying in medicine in the University of Glasgow in 1866. He served throughout the Abyssinian Campaign of 1866–68, and was in Afghanistan in 1879 and the two following years, seeing service at Kandahar and being twice mentioned in despatches. He retired from the Indian Medical Service in 1898 after 31 years of medical work, during which he occupied the chairs of pathology and midwifery at the Grant Medical College, Bombay, and held appointments as honorary obstetric physician to the Sir J. Sejabhoy Hospital, and as physician in charge of the St. George's Hospital in the same city. After his retirement Colonel Arnott was a member of the board of the Simpson Memorial Hospital and the Victoria Hospital for Consumption at Edinburgh, and was for many years adviser to the Colonial Office for Scotland.

Medical News.

THE IRISH DENTISTS ACT.—The Dentists Act, which has received the signature of the Governor-General of the Irish Free State, imposes certain duties on the Medical Registration Council. In the first place, it will be the duty of the Council, on request by the Minister, to nominate three members of the Dental Board. These will be the first members of the Board to be appointed, and it will be their duty, together with the member nominated by the Executive Council, to proceed with the election of the remaining members. Further, after the establishment of the Register, the Medical Council will have the duty of satisfying itself that the standard of theoretical and practical knowledge required at the qualifying examinations in dentistry is such as to guarantee the possession of knowledge requisite for the efficient practice of dentistry or dental surgery. The Medical Council is, therefore, the supervising authority in regard to education, but all disciplinary powers are given to the Dental Board. In this respect the Irish Act differs from the law in force in Great Britain. In the form in which the Act passed, there is no interference with the privilege of registered medical practitioners to practise dentistry or dental surgery.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Monday, August 27th, a two weeks' course will begin at the Queen Mary's Hospital, Stratford. This is an all-day course, and instruction will be given in medicine, surgery, and the specialties. From Sept. 11th to Oct. 5th, on Tuesdays and Saturdays at 11 A.M., there will be lecture-demonstrations on Psychological Medicine at the Bethlem Royal Hospital. From Sept. 17th to 29th four courses have been arranged. The Queen's Hospital, Hackney-road, will give a course on Diseases of Children occupying the whole of each day. Lecture-demonstrations in ophthalmology will be given during the afternoon by the staff of the Royal Eye Hospital; an all-day course in orthopædics will be held at the Royal National Orthopædic Hospital; and the Westminster Hospital will give a course, also intensive, in medicine, surgery, and the specialties. From Sept. 26th to Oct. 17th a series of lecture-demonstrations in electrotherapy will be given at the Royal Free Hospital. Copies of all syllabuses and information about the General Course at the affiliated hospitals may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

THE LATE MR. W. M. OAKDEN.—The death occurred on August 12th of William Marshall Oakden, B.Chir. Camb., F.R.C.S. Eng., medical superintendent of St. Luke's Hospital, Lowestoft. Mr. Oakden, who was in his forty-second year, was educated at Peterhouse, Cambridge, entering St. Thomas's Hospital with an entrance scholarship and taking the Bristowe medal. Qualifying in 1911 he served as house surgeon, casualty officer, and medical officer in the infectious wards of his own hospital. During the war he went out with the Salonika expeditionary force, and acted as temporary assistant surgeon at St. George's Hospital. After experience as senior assistant medical officer at Queen Mary's Hospital, Carshalton, he was put in charge of the large convalescent hospital at Lowestoft, where the Metropolitan Asylums Board deals with all its cases of adult surgical tuberculosis.

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.

Barry Accident and Surgical Hospital.—H.S. At rate of £200.

Bath, Royal United Hospital.—H.P., H.S., and Asst. H.S. At rate of £120 and £100 respectively.

Bedford County Hospital.—H.S., also Asst. H.S. At rate of £175 and £130 respectively.

Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200.

Bradford, Children's Hospital.—H.S. £120.

Bristol General Hospital.—H.P.'s, H.S.'s, &c. All at rate of £100.

Bristol Royal Infirmary.—H.P.'s, H.S.'s. Also Dental H.S. Each at rate of £80.

Cairo, Egyptian Government Public Health Dept.—Director of Endemic Diseases Section. L.E. 900 to 1140.

Cairo, Egyptian University.—Faculty of Medicine: Professor of Forensic Medicine. L.E. 1500. Also Prof. of Clin. Surg., &c.

Calcutta School of Tropical Medicine and Hygiene.—Professor of Tropical Medicine.

Carlisle, Cumberland Infirmary.—H.S. At rate of £175. H.P. At rate of £155. Also H.S. to Special Depts. At rate of £150.

Carmarthen, Joint Counties Mental Hospital.—Jun. Asst. M.O. £300.

Chester Royal Infirmary.—H.P. £120.

Dreadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110. Also Surgeon to Out-patients.

Hayward's Heath, King Edward VII. Memorial (Eliot) Hospital. Hon. Surg.

Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—H.P. At rate of £110.

Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.

Hull, City and County of Kingston-upon-Hull.—Asst. M.O.H. £600.

Kingston-on-Thames, Surrey County Sanatorium, Milford, near Godalming.—Sen. Asst. Res. M.O. £500.

Leicester Royal Infirmary.—Res. M.O.'s. Each at rate of £125.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Liverpool, David Lewis Northern Hospital.—Surg. Reg. and Asst. Pathologist, Surg. Reg., Tutor and Asst. Pathologist. Each £145. Also Med. Reg. and Tutor. £120.

Lowestoft, St. Luke's Hospital.—Med. Supt. £800.

Manchester, Monsall Hospital for Infectious Diseases.—Second Asst. M.O. Also Jun. M.O. At rate of £375 and £350 respectively.

Manchester, Park Hospital, Davyhulme.—Three R.M.O.'s. One at rate of £150 and two at rate of £120.

Manchester, Royal Children's Hospital, Gartside-street.—Asst. M.O. At rate of £150.

Manchester, Royal Children's Hospital, Pendlebury.—Res. Surg. Officer. At rate of £125.

Metropolitan Ear, Nose and Throat Hospital, Fitzroy-square, W.—H.S. £150.

National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. At rate of £150.

Newcastle-upon-Tyne, Hospital for Sick Children.—Jun. H.S. At rate of £100. Also Res. Sen. H.S. and Res. P. Each at rate of £95.

Newport, Mon., Cefn Mably Hospital, Michaelstone-y-vedw.—Asst. Res. M.O. £200. Also Third Asst. Res. M.O. at South Wales Sanatorium, Talgarth, near Brecon. £200.

Nottingham City Mental Hospital.—Jun. Asst. M.O. £350.

Plymouth, South Devon and East Cornwall Hospital.—H.S. At rate of £50.

Prince of Wales's General Hospital, Tottenham, N.—Res. Anæsthetist. At rate of £120.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Asst. Res. M.O. At rate of £80.

Rochester, St. Bartholomew's Hospital. H.P. At rate of £175.

Royal Air Force Medical Service.—Commissions.

St. George's Hospital Medical School, S.W.—Pathologist and Lecturer in Pathology. £575.

St. Mary Abbot's Hospital, Kensington.—Part-time Pathologist, &c. £650.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.

Salford Municipal Maternity Home and Babies' Hospital, Seedley-terrace, Pendleton.—Asst. Maternity and Child Welfare M.O. £600.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.

Truro, Royal Cornwall Infirmary.—H.S. £170.

University College Hospital Medical School.—Radcliffe Crocker Travelling Scholarship in Dermatology. £280.

University of London, S. Kensington, S.W.—William Julius Mickle Fellowship. £200.

Wandsworth Borough Council.—Locum Tenens, Asst. M.O.H., &c. £10 10s. weekly.

Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.

West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. Each at rate of £100.

Western Australia Lunacy Dept.—Jun. Asst. Res. M.O. £456.

Weston-super-Mare Hospital.—Res. M.O. £130.

Wolverhampton and Staffordshire Hospital.—H.S. At rate of £150.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons:—Hawes (Yorks, North Riding), Youlgreave (Derbyshire), Southport (Lancashire), Torpoint (Cornwall), and Olney (Bucks).

Births, Marriages, and Deaths.

BIRTHS.

BYRD.—On August 19th, Dr. Elizabeth C. Byrd (née Powell), the wife of Dr. John D. Byrd, St. Aubyn, Cecil-avenue, Ashton-on-Mersey, of a son.

GODDARD.—On August 15th, at Lincoln House, Hemel Hempstead, to Gladys, wife of Dr. T. R. Goddard—a son.

RAINER.—On August 17th, at "Shirlands," Herne Hill, S.E. 24, to Kathleen, wife of Dr. Charles Farrell Rainer—a daughter.

MARRIAGES.

JARMAN—CUMMING.—On August 15th, at St. Marylebone Parish Church, W., Mr. Ronald Jarman, L.R.C.P. Lond., M.R.C.S. Eng., and Mary Putnam, only daughter of the late Mr. James W. Cumming, of Huddersfield, and Mrs. Cumming, of Haslemere, Surrey.

DEATHS.

SYME.—On August 14th, suddenly, William Smith Syme, Senr., M.D., F.R.F.P. & S. Glasg., F.R.S.E., of 11, Lynedoch-crescent, Glasgow.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Ingleby Lectures

ON

SOME RECENT ADVANCES IN OUR KNOWLEDGE OF RICKETS AND ALLIED DISEASES.

Delivered at the University of Birmingham

BY LEONARD G. PARSONS, M.D., F.R.C.P. LOND.,
PHYSICIAN TO THE CHILDREN'S AND GENERAL HOSPITALS, BIRMINGHAM.

LECTURE I.*

THE renaissance of medicine, or perhaps it were better to say the birth of physiology, occurred exactly 300 years ago, when the immortal William Harvey published his treatise "Exercitatio Anatomica de Motu Cordis et Sanguinis." It is interesting to speculate on the connexion between this event and the recognition of the disease which forms the subject upon which I have chosen to speak. There is no doubt that Harvey's discovery profoundly impressed the scientific world of his time; indeed, his work was universally accepted, and "inculcated as a canon in most of the medical schools in Europe" during his lifetime. I think that there can be no question that this discovery stimulated many of the doctors of his day to closer observation and led to the recognition of rickets. Although it seems certain that rickets existed at least 200 years before Harvey's day, yet it only appears for the first time in the list of diseases in the London yearly bills of mortality in the year 1634. During the early seventeenth century these bills seem only to have been printed in years of extraordinary mortality. The earliest known copies belong to the year 1625, and there are bills extant for 1629, 1630, 1631, 1632, 1633, 1634, &c., but it is only in the year 1634 that rickets occurs as one of the causes of death. It is probable, however, that Harvey's work had an even more important influence on the knowledge of rickets, since in the year "De Motu Cordis" was published, Francis Glisson was lecturer in Greek, and in the following year Dean of Gonville and Caius College, Harvey's own College. It surely must be something more than a mere coincidence that he should then turn his attention to medicine, proceeding to the degree of doctor of medicine in the year 1634. Glisson later became one of the members of a small society which met weekly in London for the purpose of promoting inquiries into natural and experimental philosophy, and which after the Reformation developed into the Royal Society. Seven members of this Society, all Fellows of the Royal College of Physicians, "communicated to each other observations concerning this new disease. From these it was thought proper to make extracts and compose an express treatise on the subject, the care of which was unanimously delegated to Drs. Glisson, Bates, and Regemorter. The plan at first agreed on was that each should take a separate part of the work and complete it. But on Dr. Glisson finishing his, which contained an investigation of the cause of the disease, to the satisfaction of the other two, but with many opinions peculiar to himself, they changed their design and committed to him the planning of the whole work that all its parts might be congruous and dependent on each other." This book, which it will be remembered bore the title "De Rachitide seu Morbo Puerili qui vulgo the Rickets dicitur," was a masterly treatise on what he considered to be an entirely new disease which had arisen some 30 years previously in Somersetshire and in his native county of Dorset. The impression created by this work was shown by the fact that rickets has ever since been known in Germany as the English disease.

Although Glisson attributed rickets to disturbed nutrition by arterial blood and believed that the bone changes were due to excessive vascularity, yet it is true to say that according to his conception rickets was a disease of the bony skeleton. He suggested the title rachitis for two reasons, partly because of its likeness to the word "rickets"—the name applied to the disease by the common people—and the other because the vertebral column was so frequently affected in this disease, ῥάχις being the Greek word for spine. Rickets, on the other hand, is probably derived from the Anglo-Saxon word wrickken (to twist), and was applied to the disease because of the deformities which characterised severe cases. This word has passed into common usage in our language; thus we speak of a rickety chair or table, a phrase which calls up in our minds the picture of a piece of furniture which can well be compared with that of a child suffering from severe rickets whose twisted limbs are ill-adapted to support its weight. Although it is true that the characteristic changes are to be found in the skeletal system, and particularly in that part of the skeleton which is growing rapidly, the view that rickets is a disease of bone is quite wrong. This idea, however, dominated the study of rickets for over 250 years, and it is only fitting that, as the birth of our knowledge of rickets can be claimed for an Englishman, its renaissance and the origin of the present conception of rickets should be shared equally by a Scotsman, Leonard Findlay, and an Englishman, Gowland Hopkins. The modern view of rickets, evolved during the last 15 to 20 years, is that the disease is a general nutritional or metabolic disorder which affects every system of the body, the early symptoms bearing no direct reference to the skeleton. Thus, rickets may show itself as a respiratory disorder in recurring attacks of bronchitis; as a gastro-intestinal affection in recurring diarrhœa; as a nervous disorder in tetany, convulsions, &c.; as a muscular disease in severe hypotonia; but eventually characteristic bone changes always occur. The development and proof of this theory has been in a large degree the work of numerous British and American investigators, and furnishes a most striking example of the interdependence of laboratory research and clinical medicine.

In order to understand how recent researches have added to our knowledge of the very complex problems of the ætiology and cure of rickets, it is necessary to have some knowledge of the radiographic appearances, the chemical processes involved in the deposition of bone, and the histological characters of normal and rachitic bone.

HISTOLOGY.

A longitudinal section of a long bone of an infant shows a clean cut end (epiphyseal line) to the shaft (diaphysis), and a disc of whitish cartilage (epiphyseal cartilage) between this and the bony epiphysis in those instances in which ossification of the epiphysis has occurred. In a rachitic bone quite a different picture is obtained. The width of the epiphyseal disc of cartilage is considerably increased. There is no epiphyseal line, but its place is taken by an irregular frayed end to the diaphysis. This frayed end, which is more vascular than normal, is usually scooped out and expanded laterally, the result of pressure, thus producing the clinical sign of enlargement of the epiphysis. To this altered extremity of the diaphysis the term metaphysis is applied.

Microscopical examination of the growing end of a normal bone reveals in passing from the epiphyseal cartilage to the diaphysis, first, ordinary hyaline cartilage followed by the zone of cartilage proliferation in which the cartilage cells become increased in number and then arranged in columns of 6 to 15 cells. The cells eventually become larger, and the number in each space increased. The cell columns are separated from each other by columns of hyaline matrix. This area is followed by the zone of provisional calcification in which lime salts are

deposited in the columns of matrix. As a result the columns become rigid and thus direct the budding capillaries from the marrow up against the cartilage cells, which are either destroyed by erosion or become lost in the medullary spaces. The columns themselves are then partly destroyed and partly act as centres round which osteoblasts arrange themselves and form bone which at first contains no calcium and is known as osteoid. In health this osteoid layer is only a narrow area in which calcium is soon deposited and true bone formed.

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* Lecture II. will appear in a coming issue of THE LANCET.

In rickets this orderly arrangement is completely lost. The zone of cartilage proliferation is increased vertically and laterally, the columnar arrangement being at first manifest, but the cells in the column are more numerous and soon this design is lost and the cells appear as masses in a hyaline matrix. The zone of provisional calcification is absent, with the result that the marrow vessels grow in all directions. The osteoid layer is greatly thickened and forms the rachitic metaphysis; in it are islands of cartilage cells, wide spaces containing marrow, and in its deeper parts irregular depositions of calcium forming true bone and producing the characteristic dentate frayed appearance of the end of the metaphysis.

When healing takes place, the first thing to occur is the deposit of calcium in the cartilage where the zone of provisional calcification should have been. This at first is a thin irregular line, but as healing advances it thickens, depositions of calcium occur in the osteoid tissue, and the cartilage in the metaphysis gradually disappears. Osteoid tissue is also present under the periosteum in larger amounts than normally, producing irregular masses, buttressing, and the elimination of the sharp angles, borders and prominences of the long bones, and giving rise in the membrane bones of the skull to bossing.

The typical microscopical findings in rickets are: (1) the presence of large amounts of osteoid tissue; and (2) the substitution of disorder for order.

RADIOGRAPHIC MANIFESTATIONS.

These are best studied in the lower end of the radius. Except in very slight cases the bone trabeculæ are more coarse and blurred than normal. This coarsening increases as the disease advances and becomes very marked in severe cases. The appearance of the metaphysis varies with the degree of activity of the child, and, therefore, with the severity of the disease. In those children who are not too ill to be fairly active the end of the diaphysis is scooped out and expanded laterally, the so-called "champagne-glass" appearance. The distance between the epiphysis and the diaphysis is increased, and in place of the sharp epiphyseal line there is an irregular frayed margin. The frayed-out ends of bone gradually fade away towards the epiphyseal disc of cartilage until no bone shadow is seen. This is the characteristic appearance of the rachitic metaphysis in what has been called by Wimberger the active form of florid rickets. The appearance, however, is not seen in all the long bones even in this active form; for instance, it is never seen at the lower end of the humerus. If the disease is so severe that the child is unable to crawl or walk, the passive type of florid rickets is found. In this variety the distance between the epiphysis and diaphysis is still greater, but the transition from bone to cartilage is much more abrupt than in the active form of florid rickets. Although the end of the diaphysis is not sharply defined, yet the irregular fraying is not marked, neither is there any scooping out, nor lateral expansion of the diaphysis.

When healing commences a line of shadow appears at a short distance from the end of the metaphysis. This line is due to the formation of a zone of provisional calcification, and represents the epiphyseal line in a normal bone; its distance from the diaphysis depends upon the width of the rachitic zone of the osteoid tissue, and varies directly with the duration of the disease. As improvement continues the space between this line and the diaphysis is gradually filled in by bone in the form of striæ; the shadow of the whole bone increases in intensity; and the epiphyseal line become more dense and regular, until eventually the end of the bone shows a normal appearance. The epiphyseal line may remain slightly wavy for some time and the thickened striæ in the diaphysis behind the metaphysis can be distinguished for many months after healing is complete. In some cases of the passive type the first sign of healing is shown by the development of shadows at the margins of the metaphysis, suggesting the development of a mild degree of the cupping which is so characteristic of the active type. As the bone heals the subperiosteal osteoid tissue also ossifies and becomes evident in the radiogram along the shafts of the long bones, particularly the radius, ulna, fibula, and humerus.

MECHANISM OF THE DEPOSITION OF CALCIUM PHOSPHATE AS BONE.

This is a somewhat complicated problem, but viewed in its simplest terms we may, with Howland, regard the serum and circulatory fluids as normally saturated or supersaturated solutions, in which the calcium phosphate of bone is in equilibrium with the dissolved salt and this in turn with calcium and phosphate ions. This relationship can be expressed thus:—

$$[Ca^{++}]^3 + [PO_4^{\equiv}]^2 \rightleftharpoons Ca_3(PO_4)_2 \rightleftharpoons Ca_3(PO_4)_2$$

Ionised. In solution unionised. Solid in bone.

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Both Howland and Robison hold that rachitic bone is just as able to deposit bone as is the normal bone—i.e., the fault does not lie in the bone but in the fluids that bathe it. Robison states that the phosphatase can be demonstrated both in rachitic and normal bone, and Howland bases his argument on some experiments carried out by Shipley, Kramer, and himself, some of which it was my privilege to see. Slices of rachitic bone were placed in blood serum obtained from a normal child, or in aqueous solutions containing calcium and inorganic phosphate in which the concentrations of phosphorus and calcium approximated to those of normal blood serum. These were then incubated at 37° C. and after a time typical calcification occurred. Such calcification, however, did not occur when the slices were placed in serum from a rachitic child or in aqueous solutions if the concentration of calcium and phosphorus were inadequate. Hence rachitic bone tissue is just as able to deposit calcium phosphate as is normal bone tissue, and it remains uncalcified only so long as calcium and phosphorus are supplied to it in such low ionic concentrations that precipitation of tertiary calcium phosphate cannot take place. Rickets, therefore, is not a bone disease, and the deformities are due to stresses and strains upon a soft bone and are really mechanical and not pathological changes.

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The questions which recent research has endeavoured to answer are: 1. What are the factors influencing calcium and phosphorus absorption from the bowel? 2. What are the ætiological factors concerned in the production of rickets and how can rickets be cured? These two questions are really interdependent, or are even two ways of asking the same question, but it will be convenient to consider them both and to consider the second before the first.

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milk. Skim milk, however, was easily procurable and was largely used for the feeding of infants. As a result many of these children developed nutritional disorders (dystrophia alipogenetica) often associated with xerophthalmia, which, in many instances, passed on to total blindness. The proof that this condition was due to lack of fat was forthcoming when the Danish Government took over the supplies of butter, rationed it, and allowed 250 g. weekly to each individual, with the result that xerophthalmia immediately ceased. Bloch, who described these cases, emphasised the fact that in spite of the absence of fat these children rarely developed rickets, and he concluded that absence of vitamin A caused xerophthalmia but did not produce rickets. By feeding rats on a diet deficient, amongst other things, in fat, rickets and xerophthalmia can be produced experimentally.

In 1920 Gowland Hopkins showed that it was possible to destroy vitamin A in butter and cod-liver oil by heat and aeration, and in 1922 McCollum and his co-workers found that cod-liver oil so treated would no longer cure experimental xerophthalmia but would cure rickets. It appears clear, then, that closely associated with vitamin A is another fat-soluble vitamin which has antirachitic properties, and this is called vitamin D. Cod-liver oil is a good source of both vitamins, but cow's milk, whilst rich in vitamin A, is a poor source of vitamin D. The fact that some fats contain considerable amounts of vitamin A and but little vitamin D is the probable explanation of the failure of some workers to confirm Mellanby's experiments.

It is probable that the curative action of sunlight and artificial ultra-violet irradiation in rickets is due to the synthesis of vitamin D by the activation of ergosterol, or some similar sterol, found in association with cholesterol in the skin. Indeed, irradiated ergosterol is so potent that it has been suggested that it is pure vitamin D. Evidence that irradiation does produce vitamin D *in situ* is found in the fact that rats fed on a dietary producing the low phosphorus type of rickets develop an alkalinity of the fæces, the pH of which can be reduced, even to the acid side of neutrality, by irradiation or by the administration of irradiated ergosterol or cod-liver oil. Further evidence that irradiation of the cholesterol (or ergosterol) of the skin has a curative action is found in the observation of Hume, Henderson-Smith, and Lucas that inunction of irradiated cholesterol into the skin of rabbits and rats fed on a rickets-producing dietary prevented the development of rickets.

Whence comes the vitamin D present in cod-liver oil? It has been stated that this is obtained from the green algæ and diatoms (plankton) in the upper waters of the ocean, and that in these vitamin D is synthesised under the influence of sunlight. This plankton constitutes the food of small fish, which in their turn form the diet of the cod, and in the latter the vitamin is largely housed in the liver. The most recent researches, however, show that, whilst the marine diatom is a rich source of vitamin A, it contains no vitamin D, and the suggestion has been made that, both in relation to green plankton and green vegetables, which contain much vitamin A but little or any D, the same mistake has been made as in the earlier work of Mellanby on fats when no differentiation was made between the A and D vitamins. Moreover, Bills has shown that the principal food of the Newfoundland cod is the caplin, but that this does not contain enough vitamin D to account for the amount of vitamin which is accumulated by the cod during its midsummer period of fattening, and he therefore suggests that the vitamin may be synthesised by the cod.

The exposure of an animal to sunlight raises the content of vitamin D in its milk, and for this reason cow's milk shows a seasonal variation in vitamin D content which is related to similar seasonal variations in the incidence of rickets. The content of vitamin D, however, is not greatly increased by sunlight, but can, on the other hand, be considerably augmented by exposing the animal to ultra-violet rays from artificial sources, although such milk will not compare in antirachitic power with milk irradiated directly. It seems evident, therefore, that during the winter months breast milk must be considerably poorer in vitamin D than in the summer. However, it has been proved, as in the case of cow's milk, that the antirachitic properties of human milk can be increased by the irradiation of the mother, and that if cod-liver oil be given to her, the vitamin D can pass into her milk. Although it is a matter of universal clinical observation that rickets is far less common in children who are breast-fed, the question of the antirachitic effect of human milk and its relationship to vitamin D is one of great interest and difficulty. This difficulty will become even greater if confirmation is obtained of some recent experiments of Hess, from which he concludes that human milk is exceedingly poor in the antirachitic substance, and that its high protective power in rickets cannot be ascribed to that factor. McCollum states that animal experiments make it clear that faulty nutrition of the mother during pregnancy and the early part of the nursing period may so debilitate her young that later a diet which should protect against rickets may fail to do so, and, according to Greenbaum, if the maternal diet during the last three months of pregnancy is made approximately correct in caloric and mineral intake, rickets will not be absolutely prevented, but the mother's diet will have a controlling influence in the development of the disease in the offspring.

Rickets, however, does frequently occur in breast-fed premature children, twins, and particularly in dark-skinned Italian and negro children living in North American cities. Prolongation of breast-feeding into the second year of life is also very liable to produce rickets. The conditions under which Eskimo children live are of great interest in this connexion. In Greenland rickets does not exist, despite the fact that children are nursed until the age of 2 to 4 years, whereas in Labrador, although the children are much more exposed to sunshine, rickets is almost universal. The Greenland Eskimo, contrary to popular belief, eats little fat, but partakes freely of uncooked fish, birds, seals, &c., and the freedom from rickets is probably due to the presence in this diet of considerable quantities of vitamin D derived from the fish on which the birds and seals feed. The Labrador Eskimo, on the other hand, cooks his food, a large proportion of which is prepared or tinned, and eats very little vegetables (Thomas).

Calcium and Phosphorus.

From what has previously been stated, it is obvious that another important factor in the dietary is an ample supply of calcium and phosphorus. Adequate supplies of vitamin D or sunshine will prevent or cure rickets even when a baby is taking a diet which, from deficiency in calcium, phosphorus, or vitamin, would otherwise produce rickets.

Of all the factors concerned in the prevention of rickets, exposure of the body to sunshine and the preservation of the natural habitat of the child and diet of the mother are probably the most important. As clothing increased, and with it the urbanisation of society, the migration into cities and darkened dwellings, or, as in the case of the negro peoples, if movement occurred into more temperate zones, or, as in the case of the Labrador Eskimo, the maternal diet so changed that the supply of vitamin D diminished, rickets developed even in breast-fed children, but with more certainty in those artificially fed. Thus we have the appearance and development of rickets associated with the progress of civilisation, and in particular, with the rise of industrialism and the decline of breast-feeding.

As a result of these recent advances in our knowledge of the ætiology of rickets, the question may well be asked: was Glisson right in his view that rickets was a disease which had made its appearance for the first time but a few years before his monograph was written? It is true that the factors necessary for the production of rickets have been present, at incidence of rickets. The greatest incidence of the disease is in the late winter and early spring months—e.g., January to May—but the seasonal variations are much more marked in countries with a considerable amount of sunshine, such as Canada, the United States of America, and Austria, than in countries like the British Isles in which, indeed, the season variations are not very obvious. It is interesting to note that coincident with the seasonal incidence of rickets there is a seasonal decrease in the calcium and phosphorus of the blood. Recent observations by Brown and Tisdall, in Toronto, have shown that there is a sharp rise in the antirachitic effect of sunshine about the beginning of March, and that the antirachitic effect of April and May sunshine is about eight times that of December, January, and February. The same investigators also found that a considerable amount of ultra-violet irradiation takes place as a result of reflected rays from the sky and clouds, the antirachitic effect of which is approximately one-half to two-thirds of that produced by what is ordinarily termed sunshine—namely, direct rays from the sun plus reflected rays from the sky. All ultra-violet rays are not of value in preventing or curing rickets. In sunshine the most effective rays are the shortest, the wave-length of which ranges from 2900 to 3130 Angstrom units. Unfortunately, in those industrial areas of the British Isles where rickets is prevalent sunshine is somewhat rare, and any that may occur is almost valueless either for prevention or cure, since the smoke pall cuts off the ultra-violet rays. Moisture of the atmosphere, such a constant feature of our climate, also cuts off many of the rays. When the atmosphere is heavy with moisture, or polluted with smoke or dust, waves shorter than 3000, or even 3100, Angstrom units may be absorbed (Hess and Anderson).

Ordinary flint window glass completely cuts off all the curative ultra-violet rays, and, therefore, several substitutes for window glazing have been invented. The one best known in this country is Vita glass, which transmits rays down to 2900 Angstrom units. Tests on rachitic babies carried out in Boston, U.S.A., by exposing them to winter sunshine near windows, showed that Corning glass and quartz glass transmitted enough ultra-violet rays to cure rickets in very black babies, but whilst Vita glass transmitted light waves to the extreme limits of the sun rays, it did not transmit them in sufficient quantities to be of use in healing black babies during the winter months, but the observers thought that better results could be obtained if longer exposures to the sun rays were given. There are two differences between Boston and this country. In the first place, it is a city with very much less smoke than our industrial cities; and, secondly, the question of black pigmented babies is one of little importance here. Vita glass is unquestionably of value in country districts, but in my opinion it is practically useless in smoky cities.

Antirachitic powers can be conferred on certain foodstuffs by exposing them to the action of ultra-violet rays. Thus milk in both liquid and dried forms, wheat, and vegetables, such as spinach, carrots, &c., have been rendered antirachitic. On further investigation this property was found to be due to the activation of certain sterols, cholesterol in the animal, phytosterol in the vegetable compounds, and the administration of irradiated cholesterol and phytosterol was found to protect rats from rickets. Active cholesterol was also found to give a characteristic absorption spectrum in the ultra-violet region. The effect of administering irradiated cholesterol to children suffering from rickets was subsequently tried at the Children's Hospital, Birmingham, and we had the privilege of demonstrating the complete and rapid cure of a case of severe and resistant rickets. The details may be of some interest because the clinical experiment was controlled as carefully as possible.

The patient, aged 3 years, had received treatment by cod-liver oil from April to September, 1925—i.e., during the spring and summer months. He was admitted into hospital in September and for one month did not receive any antirachitic treatment, but was placed on the full hospital dietary. Radiograms taken 14 days after admission showed a slight degree of healing when compared with that taken on admission, possibly due to the effect of the cod-liver oil taken before admission, but no further healing of any moment occurred between the fourteenth and twenty-eighth days.

The child was then given 1 drachm three times a day of a 3 per cent. solution of irradiated cholesterol in linseed oil for a few days, and then the dose was increased to 2 drachms three times a day. In three weeks considerable healing had occurred, and complete healing was noted in 11 weeks.

The points to notice are: (1) that the case was one of a group of rickets which is somewhat resistant to cod-liver oil therapy; (2) that a period was allowed before starting cholesterol treatment, so that the effect of any delayed healing from cod-liver oil was eliminated; (3) that cure was produced in the autumn and winter months.

Later we used irradiated cholesterol in powder form in the treatment of cœliac disease, with and without rickets, with most encouraging results. The cholesterol used was chemically pure cholesterol and was irradiated by the method suggested by Hess.

The antirachitic power of irradiated cholesterol diminishes after a time; also, unless certain precautions are taken, such as the removal of the ozone generated, prolonged irradiation renders cholesterol inactive again. We also found that some of the batches of irradiated cholesterol did not appear to be as potent as others. As a result of certain experiments, Heilbron, Kam, and Morton came to the conclusion that not cholesterol itself, but some substance associated with it is activated by irradiation, and Rosenheim and Webster found that chemically pure cholesterol, prepared by formation of its dibromo derivative and the reduction of this to cholesterol again, developed no antirachitic power after irradiation. These workers showed that only cholesterol obtained from natural sources—i.e., bile, brain, &c.—could be activated, but they came to the conclusion that the impurity itself must be a sterol since it formed an insoluble compound with digitonin. It was suggested by Windhaus that this sterol might be ergosterol, obtainable from ergot, yeast, &c., because it was the only known sterol having a structure likely to give it the required properties. Ergosterol was therefore investigated by them and also by Hess, and was found to develop intense antirachitic powers on irradiation, being about 2000 times as strong as ordinary cholesterol, and it, or a sterol closely similar to it, is now regarded as the impurity which is activated when natural cholesterol is irradiated. Ergosterol when irradiated is the most powerful antirachitic substance known; 1/10,000 mg. will protect rats from rickets, and it is estimated that 5 mg. are equivalent to 1 litre of the best cod-liver oil known. Irradiation leads to an obvious physical change in ergosterol, a yellowish resin being produced. How much of the substance is actually activated is not known, and it is possible that further experiments may yield more intensely antirachitic substances.

DIET AND VITAMINS.

In the clinical study of rickets two facts stand out. First, that the condition often develops in children who are fed on a diet rich in carbohydrates but poor in fat, such as condensed sweetened skimmed milk and many proprietary foods. Secondly, that in most instances it can be cured by the exhibition of cod-liver oil.

In 1918 Mellanby suggested that rickets might be due to the absence of an accessory food factor, and later stated that this antirachitic factor was probably identical with vitamin A. In his view cod-liver oil had the strongest, and vegetable oils scarcely any antirachitic action. Milk and yolk of egg contained a large amount of antirachitic substance. Mellanby's experiments and conclusions were, however, criticised adversely by many people. During the war Denmark exported large quantities of butter to Germany, with the result that poor people were unable to buy whole us to obtain definite figures of the end-results. It will thus be more valuable to consider whether we are satisfied with these results before discussing how we may more readily make an early diagnosis or improve the technical details of our treatment. When consulting the literature on this subject, there is found to be an extraordinary difference of opinion as to the value of surgical treatment. The early figures of Friedenwald[2] gave a most gloomy prognosis, for he found that of 1000 cases, only nine were capable of having a resection, and not one case was saved thereby. Cheever[1] also found that in a series of 236 cases, radical operation was only possible in 9·7 per cent. Many later figures give a much more hopeful outlook both as regards the possibility of performing a partial gastrectomy and of the ultimate end-results. Mayo[5] has estimated that a correct diagnosis should be made sufficiently early to permit at least 50 per cent. of radical operations, although in his own series the actual number in which a partial gastrectomy was possible was about 35 per cent. He also showed that out of 651 resections of the stomach, 38·6 per cent. were alive three years or more, and 26·5 per cent. were alive five years or more after operation. Paterson[6] also states that 24 per cent. of cases were alive and well three years after operation, and 15 per cent. after five years. Hayem[4] found that of 100 cases, 28 passed the three-year period without recurrence. I have given these observations at some length, for nine years' experience in a carefully controlled follow-up department has steadily strengthened my opinion that these later figures are much too optimistic, an opinion which I am not alone in holding. Gibson,[3] in a most valuable investigation in New York, states that "no sadder report of the disheartening status of cancer surgery has come to our attention." Of 70 cases of carcinoma of the stomach he found only one alive and well after five years, and also one only after three years. I regret to state that this experience is much more in accord with my own. It is true that we are all of us conversant with cases which have lived many years after operation. Hayem,[4] for instance, reports one who lived for 27 years, and Pearce Gould,[7] one who lived for 18 years and then had a recurrence. I also have seen a case operated upon by Mr. Hugh Lett in 1910, when I was his registrar, which was proved by microscopic examination, and who was readmitted in 1927 with an anæmia of the pernicious type which might or might not have been due to a recurrence. Such cases are, however, exceptional. In reviewing my own series the large proportion of inoperable cases is very startling. Of the 229 cases it was only possible to perform a partial gastrectomy in 78, that is, 33 per cent., a proportion probably smaller than is found with any other variety of carcinoma. It is, however, in the progress of these cases subjected to what is hoped to be a radical cure that so much disappointment lies. I have been making for the British Medical Association a careful analysis of the cases operated upon by myself in the years 1920–24 inclusive, and for the purpose of this present investigation I have added those cases operated upon before 1920. All the cases, therefore, have been operated upon for four or more years. They number in all 177, of which 62 were subjected to partial gastrectomy. Of these, three cannot be traced, one is well 15 years, one—the only sarcoma in the series—well 12 years, one well ten years, and one seven years after operation (see table).

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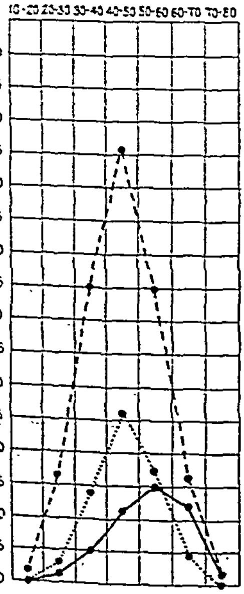

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The remainder have all died with recurrences, some of which only appeared three or four years after operation, and although it is true that many patients have been given two or three years of happy life in place of the three to six months' misery, which would occur with no operation, yet these results must be regarded as being among the most depressing in surgery. In placing these figures before you, I at once lay myself open to the charge of having performed incomplete operations. It may be said, and it probably will be said, that such poor results could only be obtained by insufficient removal of the stomach or glands. It may only be my conceit that makes me believe that this is not the true explanation, but in many cases a very wide resection indeed has been carried out so that it would best be described as a subtotal gastrectomy, and I am very doubtful if a wider removal could have been effected. Moreover, in nearly all the cases recurrence has later taken place either in the liver or in the deep cœliac glands. Therefore I feel certain that improvement in the late results does not lie in more extensive operations, and also that the figures I have put before you give a more correct picture of the results obtained by surgical treatment than many that have been published.

Improved Diagnosis.

In attempting to better our results, it is at once evident that improvement is to be looked for along two lines. The fact that only one-third of the total number of cases are operable is evidence that correct diagnoses are not being made sufficiently early. A large number of my patients have been under medical treatment for prolonged periods, often in the belief that a simple ulcer was alone present, a point to which I shall have to return later. This is, however, only applicable to a certain number. One of the greatest difficulties with which we have to contend is that in not a few cases the symptoms are at first so slight and ill-defined that the patient either seeks no treatment, or attempts to improve his symptoms by the use of domestic remedies, only seeking skilled advice a few days before operation, at which time the disease is already hopelessly inoperable. It is, indeed, difficult to see how any improvement can be made with this class of case, for it is not feasible to suggest that apparently healthy people should, after the age of 40, have routine examinations which would have to include a test-meal and the use of X ray investigations. Some improvement may, however, be expected in this direction if doctors will remember and if the public can be made to realise that any persistent dyspepsia occurring after the age of 40 in a patient with a clear past history is to be regarded as due to carcinoma until this disease can be definitely eliminated.

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It is, however, along the second line that the greatest improvement is to be expected. For many years Sir Berkeley Moynihan and others, including myself, have been laying stress upon the fact that a certain number of cases of gastric ulcer tend to least in Europe, since ancient times, although there is no reference to rickets in Hippocrates, Galen, or Celsus. Soranus of Ephesus, a physician who practised in Rome during the second century A.D., wrote thus :—

> The infant's feet become deformed from unwise attempts at walking. Frequent examples of such deformities are seen in Rome, due in most cases to ignorance and improper care of the infant. City women devote much less care to their infants than those in rural districts, hence the more frequent occurrence of these deformities among the infants of city dwellers.

☞ Surely Findlay is justified in regarding this as a description of rickets. We have, however, even more positive evidence that rickets existed 200 years before Glisson's time, for in the paintings of the *fifteenth century artists* of the Netherlands and Germany, especially those dealing with the Nativity, clinical evidence of rickets can be seen. In our own National Gallery there are several pictures of this type, but I will only mention one painted by the Netherlands artist, Dirk Bouts, in the year 1490. This picture shows definite evidence of rickets, not only in the child but also in the mother, whose forehead is an excellent example of Parrot's nodes. Anyone can multiply examples of this kind by exploring the galleries of Amsterdam, The Hague, &c. It is quite clear that in choosing models for such a subject the artist would not wittingly select those showing the stigmata of disease, but rather those approaching his ideal of perfect physical development. It is surely, therefore, a logical conclusion that in the fifteenth and sixteenth centuries, when the privations of war were frequently experienced by dwellers in the Low Countries, rickets was a common condition in the industrial cities of Holland and Germany (Foote).

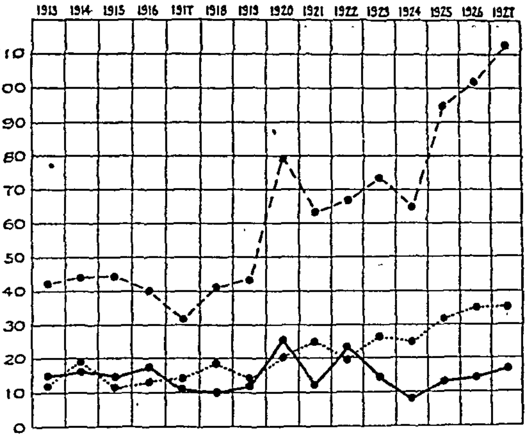
CARCINOMA OF STOMACH.*

By A. J. WALTON, M.S. LOND., F.R.C.S. ENG.,
SURGEON TO THE LONDON HOSPITAL.

IN the public mind there is a belief that cancer is not only uniformly fatal, but that it is rapidly increasing in frequency. Recent careful investigations have shown that this view is too pessimistic, and it has become quite evident that the different varieties of carcinoma vary considerably in their severity, many examples being permanently cured if subjected to early operative intervention. Of these varieties carcinoma of the stomach must, however, be considered one of the most unsatisfactory, for the early diagnosis is associated with much difficulty, and the late prognosis, as shown by more careful follow-up records, is not nearly so good as was at one time believed. It is therefore all the more satisfactory to note that there is little or no evidence that the disease is on the increase. Such a belief is based upon the returns of the Registrar-General, but these are probably of doubtful value, for with improvement in diagnostic methods cases are included that were previously omitted, and it is almost certain that many others are recorded as carcinoma when the diagnosis has not been confirmed by microscopic investigation. My own figures concern patients who have all been subjected to operation, and the diagnosis has therefore been proved either by visual inspection or by microscopical examination, confirmed in all cases by a careful observation of their after-progress. Thus, although small in number, they are of considerable interest. There has been *little or no* increase in the numbers operated upon year by year, whereas the proportion of cases of carcinoma to those of other lesions of the stomach has shown a very marked decrease. From 1913 to the present date the total number of cases of carcinoma of the stomach that have come to me for operation has been 229, and the total number of simple chronic ulcers 1086, the carcinomata thus forming about 17 per cent. of the total. In other words, of every six gastric operations one is performed for carcinoma of the stomach. The numbers of these lesions operated upon each year is shown in Fig. 1. This chart shows clearly that whereas the number of ulcer cases operated upon has multiplied nearly three times the number of carcinomata has remained nearly constant year by year.

Of more importance than the relationship to the total number of ulcers is that to ulcers of the body of the stomach, for it is this variety which is not only more likely to become carcinomatous, but is most commonly confused with carcinoma either before or during operation. Duodenal ulcers, on the other hand, may be said never to become carcinomatous, and it is this variety which has shown the greatest increase. Nevertheless, lesser curve ulcers are nearly three times as frequent in my present practice as they were in 1913.

FIG. 1.



Frequency of carcinoma and chronic ulceration. Total cases of carcinoma 229 (males 166, females 63); total cases of chronic ulcer 1086 (males 824, females 262).

In both figures the continuous line indicates "carcinoma," the interrupted line "all ulcers," and the dotted line "lesser curve ulcers."

It must be remembered that these figures, occurring as they do in the practice of one surgeon, are no evidence of an increase in the number of chronic ulcers in the general population, but since the ulcers have so greatly increased in number a corresponding increase would be expected in the numbers of carcinomata, and since it has not occurred it would suggest that carcinoma of the stomach is becoming a less frequent disease. The only explanation I can offer is that of recent years our work has been, as we should always wish it to be, preventive, and that many patients have been saved from carcinoma by having their ulcers treated surgically while they are yet benign.

The sex relationship of the two conditions shows that whereas both carcinomata and ulcers are much more common in the male, this frequency is more in evidence in the ulcers than in the carcinomata. Thus, of the 229 cases of carcinomata, 166 occurred in males and 63 in females; whereas of the 1086 ulcers, 824 were males and only 262 were females. There is also a distinct difference in the age-frequency. Carcinomata of the stomach is found most commonly between the ages of 40 and 70, the majority being present between 50 and 60; whereas the ulcers are more frequently detected earlier, being seen most commonly between the ages of 30 and 60, and with the greatest frequency between 40 and 50. In Fig. 2 the frequency of these lesions in the different decades is made apparent.

Results of Operation.

The operative treatment of carcinoma of the stomach has now been sufficiently long in vogue for us to obtain definite figures of the end-results. It will thus be more valuable to consider whether we are satisfied with these results before discussing how we may more readily make an early diagnosis or improve the technical details of our treatment. When consulting the literature on this subject, there is found to be an extraordinary difference of opinion as to the value of surgical treatment. The early figures of Friedenwald[2] gave a most gloomy prognosis, for he found that of 1000 cases, only nine were capable of having a resection, and not one case was saved thereby. Cheever[1] also found that in a series of 236 cases, radical operation was only possible in 9·7 per cent. Many later figures give a much more hopeful outlook both as regards the possibility of performing a partial gastrectomy and of the ultimate end-results. Mayo[5] has estimated that a correct diagnosis should be made sufficiently early to permit at least 50 per cent. of radical operations, although in his own series the actual number in which a partial gastrectomy was possible was about 35 per cent. He also showed that out of 651 resections of the stomach, 38·6 per cent. were alive three years or more, and 26·5 per cent. were alive five years or more after operation. Paterson[6] also states that 24 per cent. of cases were alive and well three years after operation, and 15 per cent. after five years. Hayem[4] found that of 100 cases, 28 passed the three-year period without recurrence. I have given these observations at some length, for nine years' experience in a carefully controlled follow-up department has steadily strengthened my opinion that these later figures are much too optimistic, an opinion which I am not alone in holding. Gibson,[3] in a most valuable investigation in New York, states that "no sadder report of the disheartening status of cancer surgery has come to our attention." Of 70 cases of carcinoma of the stomach he found only one alive and well after five years, and also one only after three years. I regret to state that this experience is much more in accord with my own. It is true that we are all of us conversant with cases which have lived many years after operation. Hayem,[4] for instance, reports one who lived for 27 years, and Pearce Gould,[7] one who lived for 18 years and then had a recurrence. I also have seen a case operated upon by Mr. Hugh Lett in 1910, when I was his registrar, which was proved by microscopic examination, and who was readmitted in 1927 with an anæmia of the pernicious type which might or might not have been due to a recurrence. Such cases are, however, exceptional. In reviewing my own series the large proportion of inoperable cases is very startling. Of the 229 cases it was only possible to perform a partial gastrectomy in 78, that is, 33 per cent., a proportion probably smaller than is found with any other variety of carcinoma. It is, however, in the progress of these cases subjected to what is hoped to be a radical cure that so much disappointment lies. I have been making for the British Medical Association a careful analysis of the cases operated upon by myself in the years 1920–24 inclusive, and for the purpose of this present investigation I have added those cases operated upon before 1920. All the cases, therefore, have been operated upon for four or more years. They number in all 177, of which 62 were subjected to partial gastrectomy. Of these, three cannot be traced, one is well 15 years, one—the only sarcoma in the series—well 12 years, one well ten years, and one seven years after operation (see table).

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* Being a communication made to the International Cancer Conference, recently held in London.

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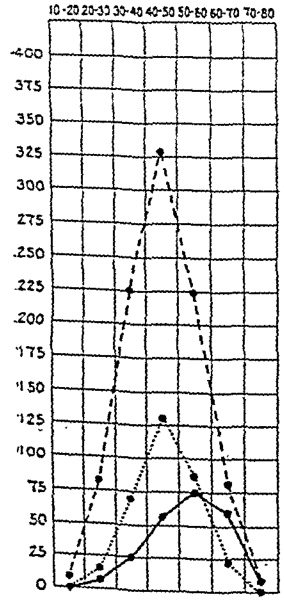

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It is, however, along the second line that the greatest improvement is to be expected. For many years Sir Berkeley Moynihan and others, including myself, have been laying stress upon the fact that a certain number of cases of gastric ulcer tend to least in Europe, since ancient times, although there is no reference to rickets in Hippocrates, Galen, or Celsus. Soranus of Ephesus, a physician who practised in Rome during the second century A.D., wrote thus :—

> The infant's feet become deformed from unwise attempts at walking. Frequent examples of such deformities are seen in Rome, due in most cases to ignorance and improper care of the infant. City women devote much less care to their infants than those in rural districts, hence the more frequent occurrence of these deformities among the infants of city dwellers.

Surely Findlay is justified in regarding this as a description of rickets. We have, however, even more positive evidence that rickets existed 200 years before Glisson's time, for in the paintings of the fifteenth century artists of the Netherlands and Germany, especially those dealing with the Nativity, clinical evidence of rickets can be seen. In our own National Gallery there are several pictures of this type, but I will only mention one painted by the Netherlands artist, Dirk Bouts, in the year 1490. This picture shows definite evidence of rickets, not only in the child but also in the mother, whose forehead is an excellent example of Parrot's nodes. Anyone can multiply examples of this kind by exploring the galleries of Amsterdam, The Hague, &c. It is quite clear that in choosing models for such a subject the artist would not wittingly select those showing the stigmata of disease, but rather those approaching his ideal of perfect physical development. It is surely, therefore, a logical conclusion that in the fifteenth and sixteenth centuries, when the privations of war were frequently experienced by dwellers in the Low Countries, rickets was a common condition in the industrial cities of Holland and Germany (Foote).

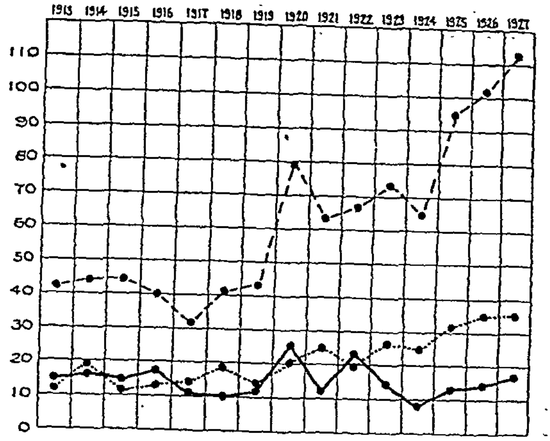
CARCINOMA OF STOMACH.*

BY A. J. WALTON, M.S. LOND., F.R.C.S. ENG.,
SURGEON TO THE LONDON HOSPITAL.

IN the public mind there is a belief that cancer is not only uniformly fatal, but that it is rapidly increasing in frequency. Recent careful investigations have shown that this view is too pessimistic, and it has become quite evident that the different varieties of carcinoma vary considerably in their severity, many examples being permanently cured if subjected to early operative intervention. Of these varieties carcinoma of the stomach must, however, be considered one of the most unsatisfactory, for the early diagnosis is associated with much difficulty, and the late prognosis, as shown by more careful follow-up records, is not nearly so good as was at one time believed. It is therefore all the more satisfactory to note that there is little or no evidence that the disease is on the increase. Such a belief is based upon the returns of the Registrar-General, but these are probably of doubtful value, for with improvement in diagnostic methods cases are included that were previously omitted, and it is almost certain that many others are recorded as carcinoma when the diagnosis has not been confirmed by microscopic investigation. My own figures concern patients who have all been subjected to operation, and the diagnosis has therefore been proved either by visual inspection or by microscopical examination, confirmed in all cases by a careful observation of their after-progress. Thus, although small in number, they are of considerable interest. There has been little or no increase in the numbers operated upon year by year, whereas the proportion of cases of carcinoma to those of other lesions of the stomach has shown a very marked decrease. From 1913 to the present date the total number of cases of carcinoma of the stomach that have come to me for operation has been 229, and the total number of simple chronic ulcers 1086, the carcinomata thus forming about 17 per cent. of the total. In other words, of every six gastric operations one is performed for carcinoma of the stomach. The numbers of these lesions operated upon each year is shown in Fig. 1. This chart shows clearly that whereas the number of ulcer cases operated upon has multiplied nearly three times the number of carcinomata has remained nearly constant year by year.

Of more importance than the relationship to the total number of ulcers is that to ulcers of the body of the stomach, for it is this variety which is not only more likely to become carcinomatous, but is most commonly confused with carcinoma either before or during operation. Duodenal ulcers, on the other hand, may be said never to become carcinomatous, and it is this variety which has shown the greatest increase. Nevertheless, lesser curve ulcers are nearly three times as frequent in my present practice as they were in 1913.

FIG. 1.



Frequency of carcinoma and chronic ulceration. Total cases of carcinoma 229 (males 166, females 63); total cases of chronic ulcer 1086 (males 824, females 262).

In both figures the continuous line indicates "carcinoma," the interrupted line "all ulcers," and the dotted line "lesser curve ulcers."

It must be remembered that these figures, occurring as they do in the practice of one surgeon, are no evidence of an increase in the number of chronic ulcers in the general population, but since the ulcers have so greatly increased in number a corresponding increase would be expected in the numbers of carcinomata, and since it has not occurred it would suggest that carcinoma of the stomach is becoming a less frequent disease. The only explanation I can offer is that of recent years our work has been, as we should always wish it to be, preventive, and that many patients have been saved from carcinoma by having their ulcers treated surgically while they are yet benign.

The sex relationship of the two conditions shows that whereas both carcinomata and ulcers are much more common in the male, this frequency is more in evidence in the ulcers than in the carcinomata. Thus, of the 229 cases of carcinomata, 166 occurred in males and 63 in females; whereas of the 1086 ulcers, 824 were males and only 262 were females. There is also a distinct difference in the age-frequency. Carcinomata of the stomach is found most commonly between the ages of 40 and 70, the majority being present between 50 and 60; whereas the ulcers are more frequently detected earlier, being seen most commonly between the ages of 30 and 60, and with the greatest frequency between 40 and 50. In Fig. 2 the frequency of these lesions in the different decades is made apparent.

Results of Operation.

The operative treatment of carcinoma of the stomach has now been sufficiently long in vogue for second and third year, five between the third and fourth year, and two after four years. My chief reason for putting these figures before you, however, is to impress upon you my belief that in this, as in other branches of medicine, the greatest progress has been and is still to be made by the use of preventive measures. An understanding of the cause of carcinoma implying, as I believe it does, a knowledge as to why a cell reverts from its unipotential character to a totipotential phase, still seems far from us, and until that time arrives, the greatest hope of preventing carcinoma of the stomach lies in the free surgical removal of all chronic ulcers. If the lay press, altering their present views, will help us with the great weight of their authority to teach the public that the majority of such ulcers should be excised, much will be accomplished in diminishing the frequency of this dread disease.

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* Being a communication made to the International Cancer Conference, recently held in London.

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1. Cheever, D.: The Operative Curability of Carcinoma of the Stomach, Ann. Surg., 1923, lxxviii., 332.
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SYPHILIS OF THE ŒSOPHAGUS.

WITH A REPORT OF TWO CASES.

BY A. LAWRENCE ABEL, M.S. LOND., F.R.C.S. ENG.,
SURGEON TO THE KENSINGTON GENERAL AND LONDON LOCK HOSPITALS; ASSISTANT SURGEON TO THE WOOLWICH WAR MEMORIAL HOSPITAL, ETC.

SYPHILIS of the œsophagus is only diagnosed in one or two of every 1000 cases presenting themselves with an œsophageal lesion. It occurs, however, in all cases of acute syphilis which remain untreated until the so-called "secondary" stage is established, but only as a part of the general inflammation of all mucous membranes, and usually there is a complete absence of any œsophageal syndrome. It is not until a secondary œsophagitis is present, or a spasmodic or organic stenosis appears, that cases of syphilis of the œsophagus come to the hands of the œsophagoscopist for diagnosis and treatment. I shall confine these remarks, therefore, to a description of syphilis of the œsophagus accompanied by the cardinal symptom of dysphagia.

Pathology.

Syphilis of the œsophagus occurs rarely in the congenital form of the disease. More commonly, in the so-called "secondary" stage, it may give rise to an œsophagitis, of such severity as to be manifested by dysphagia. The condition rapidly responds to appropriate treatment, and is very seldom followed by stenosis.

During the so-called "tertiary" period syphilis of the œsophagus is still more common, and takes the form of localised gummata. The gumma usually arises in either the upper or lower third of the canal, and on rupture produces a typical gummatous ulcer with a clearly cut edge and an unhealthy yellow base. There is considerable local induration, which, together with the concomitant spasm, is the main cause of the obstruction to the lumen. Leukoplakic patches may occur in the neighbourhood; some local non-specific œsophagitis may be present, together with a little hypertrophy of the wall and dilatation of the œsophagus above the level of the lesion.

Diagnosis.

The symptoms are those of painless dysphagia, together with those of any other syphilitic lesion which may coexist. If, however, there is any pharyngeal lesion, painful dysphagia occurs, together with some local spasm and regurgitation.

The previous history of a case is important, and leading questions must often be asked. The history of swallowing a corrosive or caustic or excessively hot fluid, or of an impacted foreign body, especially a tooth-plate, leads the clinician to doubt the existence of a true syphilitic lesion even in the presence of positive serological tests, and is more suggestive of a simple cicatricial stricture. The same is true of dysphagia following closely upon diphtheria or typhoid fever.

The duration of the dysphagia and its mode of onset is not of great value as an aid to an accurate diagnosis except when there is a definite history. Nevertheless, certain general facts should be borne in mind. Dysphagia in a case of syphilitic stenosis has usually lasted from four to twelve months before a careful examination reveals the true nature of the lesion. During this time the patient may or may not have been treated by his own medical practitioner for "indigestion," "gastritis," "gastric ulcer," "globus hystericus" or "nerves." Dysphagia of many years' standing, in the absence of a history indicative of simple stricture, is more suggestive of cardiospasm, but can be produced by a pharyngeal pouch, an œsophageal pouch, a fibrosis in the region of the crico-pharyngeal sphincter, a congenital stenosis of the œsophagus, or even by a syphilitic lesion. The onset of specific dysphagia is almost invariably gradual. Sudden difficulty in swallowing is more suggestive of an impacted foreign body or even of a malignant growth.

When syphilitic stenosis of the œsophagus is present there is usually nothing to distinguish it from any other variety of stricture except direct local examination. General examination will frequently reveal that the patient is suffering from syphilis, and there will be no clinical signs of malignancy, such as Virchow's glands. Especial attention should be paid to the mouth and throat, as signs of leukoplakia of the tongue or inner side of the cheek are rarely absent in long-standing cases. Scars are often found on the legs, and bilateral enlargement of the epitrochlear lymphatic glands, with no local condition to account for it, is always present.

Radioscopy.—After a complete general examination of the patient radioscopy is employed in order to exclude the presence of an aneurysm or other intrathoracic cause of extrinsic pressure upon the œsophagus, and to determine the level of the lesion.

Œsophagoscopy should next be resorted to, and great difficulty may be met with in making a purely visual diagnosis. This is especially so in the [illegible] ulcerated variety of gumma, which [illegible] an infiltrating carcinoma. At other times [illegible] readily diagnosed, and a portion removed for microscopical examination may reveal the true nature of the disease. The diagnostician must not be led astray by a negative Wassermann reaction of the blood, which is given by a very [illegible] sufferers from tertiary syphilis. [illegible] examination of the cerebro-spinal fluid [illegible] almost invariably confirm the clinical diagnosis of syphilis in this stage. On the other hand, a positive Wassermann reaction must not be taken to indicate that the condition is non-malignant, and therefore biopsy must always be performed. If in a doubtful case this fails to prove suspected malignant disease, it should be repeated. After two or more microscopic examinations have failed to reveal the true cause, and in the absence of a history indicative of a simple stricture, syphilis is to be strongly suspected. The diagnosis is usually confirmed by appropriate treatment.

become carcinomatous, and thus the improvement in the results of operation for carcinoma of the stomach lies in operating upon the ulcer in its still benign period. In the United States of America this relationship is well recognised, but unfortunately in this country there has been a tendency of late to belittle the relationship between the two lesions; probably this has in part been due to the fact that in the past it was claimed that the majority of cases of carcinoma commenced as chronic ulcers, a view which wider experience could not support, and hence there is a tendency for the pendulum to swing in the opposite direction. The denial of such a relationship has, however, gone hand in hand with extravagant claims for the value of medical treatment, and this of necessity, for if chronic ulcers may become carcinomatous it will clearly be inadvisable to subject them to prolonged periods of such treatment. It is also unfortunate that the lay press has widely circulated the view that all chronic ulcers can be cured by medical treatment, for there is now a tendency for patients to postpone operation and to undertake a prolonged course of medical treatment, a procedure which I feel convinced will lead to an increase in the number of cases of carcinomata of the stomach, and will undo much of the preventive treatment for which surgeons have striven so long.

In my own series of cases there has been very definite evidence that a certain number of cases of carcinoma have started as chronic ulcers. I have only placed in this group those that have fulfilled the following requirements:—

1. They must all have had a history of many years' standing in which the earliest symptoms were periodic.
2. They must all at the time of operation have had a relatively high test-meal.
3. The appearances of the lesion at operation must have suggested the presence of a chronic ulcer. In some cases, indeed, the diagnosis of chronic ulcer to the naked eye appeared to be definite.
4. The pathological report must have shown that the carcinoma was almost certainly secondary to an ulcer.

In my own series of 229 cases there were 25 examples which conformed with these requirements, and these, of course, do not include any examples which had progressed so far that a radical operation was not possible, or those which had led to a complete achlorhydria. Hence, this figure probably much underestimates the frequency. They are of special importance, for it is in such cases that a radical cure is most to be expected. My patient, who is alive and well seven years after operation, was only recognised to be a case of carcinoma after the microscopic examination, but a partial gastrectomy was carried out on suspicion owing to a slight alteration in the symptoms. She was therefore treated at the earliest possible stage. Of equal importance with this group are those cases which are definitely but erroneously diagnosed as simple chronic ulcers before operation, for it is these cases especially in which medical treatment is likely to be continued and the opportunities of early operation are lost. I have elsewhere pointed out that since the recent vogue for medical treatment four such cases have come to me when the carcinoma was hopelessly advanced. In my own series there were 55 such cases, a percentage of nearly 25 of the total. These had been definitely diagnosed by physicians of wide experience and repute as simple chronic ulcers, and it was only at operation that the evidence of carcinoma was forthcoming. To my mind, therefore, there can be no question whatever that the hope of greater success in the future lies not only in a wider recognition of the early symptoms of carcinoma, but also in the acceptance of the belief that chronic ulcers in patients between the age of 40 and 60 should be subjected to early operative treatment, and should not be treated medically for a long period of time. It is probably owing to such a course of action that my figures show no increase but rather a definite relative decrease in the frequency of carcinoma of the stomach, and every effort must be made not to lose this advantage.

Early Symptoms and Early Treatment.

In the recognition of the important early symptoms, special stress must be laid upon the fact that after a perfectly clear past history the majority of patients have developed a dyspepsia persisting for two or three weeks. I have always taught, and I am confident that it is correct, that if there is no definite error of diet to account for such a group of symptoms, those patients should be regarded as carcinomatous unless definite evidence can be produced to show that they are suffering from some other lesion. It is perfectly true that occasionally, if such a dictum is accepted, a patient will be operated upon and will be found to be suffering only from a gastritis, possibly of an atonic type due to overwork and worry; a careful investigation will, however, often eliminate such a condition. In the few remaining cases it has been my experience, much as I deprecate the use of an exploratory laparotomy, that such patients are so pleased to find that they are not suffering from a carcinoma that they will only too willingly put up with the drawbacks of an unnecessary laparotomy. I have been honoured by having been asked to operate upon a large number of medical men, and these patients, who are those best able to realise the drawbacks of operation, have been only too willing to face the possibility of an unnecessary laparotomy if in the end they can be assured that no carcinoma is present, and it would seem self-evident that the line of conduct which a medical man would choose for himself is the one which he can best advise his patients to follow. Of the individual symptoms of the different varieties of carcinoma I shall say but little, for these have been described upon so many occasions that they should now be well recognised. To briefly sum them up, they are the constancy and often the mild degree of the pain, which, although increased by the taking of food, does not completely disappear in the course of the day, the steady and progressive loss of appetite, the increased feeling of lassitude, weakness, and the loss of the usual feeling of well-being, the presence of frequent regurgitation rather than of actual vomiting, and the failure of relief to be given to the pain thereby. It is especially the supervention of such symptoms upon a case presenting a typical history of gastric ulcer which would lead us to infer that the ulcer has become carcinomatous, but one would hope that in the future this change will be seen less and less as the long-persistent ulcers are more frequently treated by operation. It is well, also, to point out here that cases are seen where there is severe pain, and where there is vomiting of the obstructive type, or where there is hæmatemesis which may be sudden and severe, and that the presence of such symptoms, which are usually regarded as more definite evidence of a gastric ulcer, are no counter-indication of the presence of carcinoma. It is also well to remember that although a test-meal and X ray investigation are of very great value, a high test-meal does not of necessity eliminate the possibility of carcinoma, and neither does a negative X ray.

Such symptoms occurring in a patient over 40 must always be regarded with the most grave suspicion, and it is by the recognition of their importance that one must hope to obtain better results in the treatment of this most dangerous and depressing variety of carcinoma. Although at present but few cases have been cured by operative treatment, there can be no question but that a small percentage are so cured, and of this benefit every patient must be given the advantage at the earliest opportunity, for all other methods known to us at present, such as the use of radium and deep X ray therapy, are—useful though they may be—no more than palliative procedures. It must also be remembered that whereas cases which are not operated upon have an average expectation of life of only three to six months, those who are treated by partial gastrectomy not infrequently live for three or four years in happiness and comfort. In my own series, 15 cases showed evidence of recurrence only between the second and third year, five between the third and fourth year, and two after four years. My chief reason for putting these figures before you, however, is to impress upon you my belief that in this, as in other branches of medicine, the greatest progress has been and is still to be made by the use of preventive measures. An understanding of the cause of carcinoma implying, as I believe it does, a knowledge as to why a cell reverts from its unipotential character to a totipotential phase, still seems far from us, and until that time arrives, the greatest hope of preventing carcinoma of the stomach lies in the free surgical removal of all chronic ulcers. If the lay press, altering their present views, will help us with the great weight of their authority to teach the public that the majority of such ulcers should be excised, much will be accomplished in diminishing the frequency of this dread disease.

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SYPHILIS of the œsophagus is only diagnosed in one or two of every 1000 cases presenting themselves with an œsophageal lesion. It occurs, however, in all cases of acute syphilis which remain untreated until the so-called "secondary" stage is established, but only as a part of the general inflammation of all mucous membranes, and usually there is a complete absence of any œsophageal syndrome. It is not until a secondary œsophagitis is present, or a spasmodic or organic stenosis appears, that cases of syphilis of the œsophagus come to the hands of the œsophagoscopist for diagnosis and treatment. I shall confine these remarks, therefore, to a description of syphilis of the œsophagus accompanied by the cardinal symptom of dysphagia.

Pathology.

Syphilis of the œsophagus occurs rarely in the congenital form of the disease. More commonly, in the so-called "secondary" stage, it may give rise to an œsophagitis, of such severity as to be manifested by dysphagia. The condition rapidly responds to appropriate treatment, and is very seldom followed by stenosis.

During the so-called "tertiary" period syphilis of the œsophagus is still more common, and takes the form of localised gummata. The gumma usually arises in either the upper or lower third of the canal, and on rupture produces a typical gummatous ulcer with a clearly cut edge and an unhealthy yellow base. There is considerable local induration, which, together with the concomitant spasm, is the main cause of the obstruction to the lumen. Leukoplakic patches may occur in the neighbourhood; some local non-specific œsophagitis may be present, together with a little hypertrophy of the wall and dilatation of the œsophagus above the level of the lesion.

Diagnosis.

The symptoms are those of painless dysphagia, together with those of any other syphilitic lesion which may coexist. If, however, there is any pharyngeal lesion, painful dysphagia occurs, together with some local spasm and regurgitation.

The previous history of a case is important, and leading questions must often be asked. The history of swallowing a corrosive or caustic or excessively hot fluid, or of an impacted foreign body, especially a tooth-plate, leads the clinician to doubt the existence of a true syphilitic lesion even in the presence of positive serological tests, and is more suggestive of a simple cicatricial stricture. The same is true of dysphagia following closely upon diphtheria or typhoid fever.

The duration of the dysphagia and its mode of onset is not of great value as an aid to an accurate diagnosis except when there is a definite history. Nevertheless, certain general facts should be borne in mind. Dysphagia in a case of syphilitic stenosis has usually lasted from four to twelve months before a careful examination reveals the true nature of the lesion. During this time the patient may or may not have been treated by his own medical practitioner for "indigestion," "gastritis," "gastric ulcer," "globus hystericus" or "nerves." Dysphagia of many years' standing, in the absence of a history indicative of simple stricture, is more suggestive of cardiospasm, but can be produced by a pharyngeal pouch, an œsophageal pouch, a fibrosis in the region of the crico-pharyngeal sphincter, a congenital stenosis of the œsophagus, or even by a syphilitic lesion. The onset of specific dysphagia is almost invariably gradual. Sudden difficulty in swallowing is more suggestive of an impacted foreign body or even of a malignant growth.

When syphilitic stenosis of the œsophagus is present there is usually nothing to distinguish it from any other variety of stricture except direct local examination. General examination will frequently reveal that the patient is suffering from syphilis, and there will be no clinical signs of malignancy, such as Virchow's glands. Especial attention should be paid to the mouth and throat, as signs of leukoplakia of the tongue or inner side of the cheek are rarely absent in long-standing cases. Scars are often found on the legs, and bilateral enlargement of the epitrochlear lymphatic glands, with no local condition to account for it, is always present.

Radioscopy.—After a complete general examination of the patient radioscopy is employed in order to exclude the presence of an aneurysm or other intrathoracic cause of extrinsic pressure upon the œsophagus, and to determine the level of the lesion.

Œsophagoscopy should next be resorted to, and great difficulty may be met with in making a purely visual diagnosis. This is especially so in the non-ulcerated variety of gumma, which closely simulates an infiltrating carcinoma. An actual ulcer is more readily diagnosed, and a portion removed for microscopical examination may reveal the true nature of the disease. The diagnostician must not be led astray by a negative Wassermann reaction of the blood, which is given by a very large proportion of sufferers from tertiary syphilis. The pathological examination of the cerebro-spinal fluid will, however, almost invariably confirm the clinical diagnosis of syphilis in this stage. On the other hand, a positive Wassermann reaction must not be taken to indicate that the condition is non-malignant, and therefore biopsy must always be performed. If in a doubtful case this fails to prove suspected malignant disease, it should be repeated. After two or more microscopic examinations have failed to reveal the true cause, and in the absence of a history indicative of a simple stricture, syphilis is to be strongly suspected. The diagnosis is usually confirmed by appropriate treatment.

I wish most strongly to emphasise that syphilis of the œsophagus must not be diagnosed by symptoms and serological tests alone, because many patients who have carcinoma of the œsophagus have also active syphilis. As I have shown elsewhere,[1] it is most important that cancer of the œsophagus should be treated at the earliest possible moment; direct œsophagoscopic examination must, therefore, be made in all cases with symptoms of an œsophageal disease.

FIG. 1.

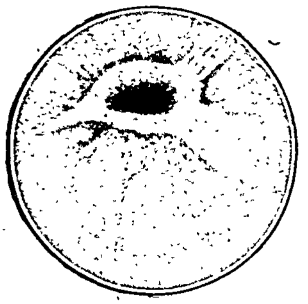


FIG. 2.

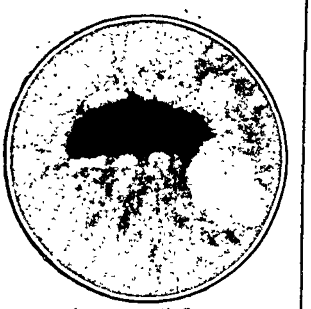


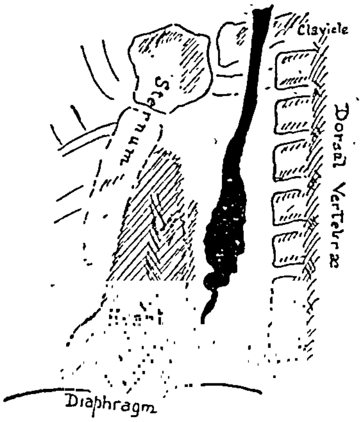
FIG. 1 (Case 1).—Syphilitic stricture of the œsophagus (cervical region) as seen through the œsophagoscope before treatment.
FIG. 2 (Case 1).—Seven days after dilatation with bougies.

Treatment.

Treatment is undertaken along two lines: (1) Antisyphilitic treatment; (2) œsophageal treatment to combat the actual or potential stenosis.

1. In acute syphilis, arsenic is administered intravenously for eight weeks, provided it has not been previously used in large quantities in the same patient. If it has, then only a shorter course of arsenic should be given. The dose varies from 0·45 to 0·6 g. in the female, and from 0·6 to 0·9 in the male, at weekly intervals. At the same time as the arsenical injection an intramuscular injection of mercurial cream or bismuth is given. At about the middle, and at the end of this course of treatment, an intramuscular injection of 0·25 g. of contramine should be given. After the last injection of contramine the patient is allowed four weeks' rest from injections and given potassium iodide grs. 5 in plenty of water, three times a day by the mouth. After this, intramuscular injections should be recommenced, and continued once a week for eight weeks. They may consist of either gr. 1 of mercury as a mercurial cream given each week, or 0·2 g. of an oily suspension of bismuth. By far the best preparation of bismuth in my experience is iodo-bismuthate of quinine (Fraisse), and this may be used with benefit alternately with the injections of mercury. After eight injections the patient is given four weeks' treatment by medicine—either potassium iodide as before, or collosol sulphur, 1 drachm three times a day; then eight weeks on a heavy metal and four weeks on a non-metal, and so on. The arsenical treatment should not be repeated.

FIG. 5.



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In secondary syphilis this treatment should be continued for at least three years, and no notice whatever need be taken of the Wassermann reaction, whether positive or negative, during this time. In tertiary syphilis arsenic may be used, but its effect is not so good as in the early stages of the disease, and in my experience it is inferior to bismuth given as iodo-bismuthate of quinine (Fraisse). In tertiary and congenital lesions I strongly advise continuing injections of bismuth for at least four years, with four weeks' rest after each two months' injections; or alternate courses of injections may consist of bismuth for one course, mercury for the next, and so on.

FIG. 3.

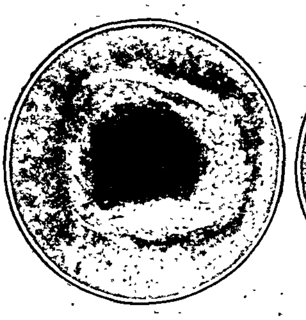

FIG. 4.

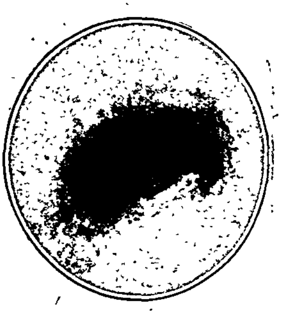

FIG. 3 (Case 1).—Two months later.
FIG. 4 (Case 1).—Eleven months later. (Since then no abnormality has been seen on œsophagoscopy.)

Œsophageal Treatment.

Every healed and healing gumma of the œsophagus is accompanied by fibrosis and contraction; therefore the œsophagus must be subjected to frequent dilatations during the early months of the treatment, but later this need only be done at rare intervals, in order to be quite sure that no further active contraction is taking place. In the first instance it should be done under direct vision and, if no contra-indication such as excessive dilatation or diverticulum is present, may subsequently be performed blindly.

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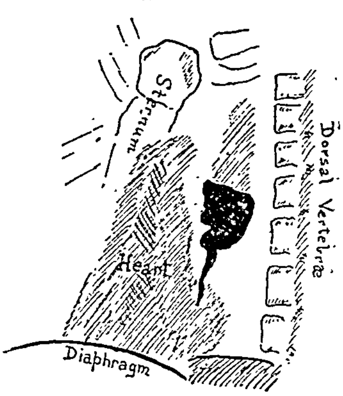

FIG. 6 (Case 2).—Diagram of radiogram of same case as Fig. 5 taken one hour later.

Physical Examination.—The patient was thin, but not cachectic. She said she had lost a little weight. Colour good. Complete artificial dentures. Both epitrochlear glands were enlarged, but otherwise there were no clinical signs of any abnormality.

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FIG. 7.

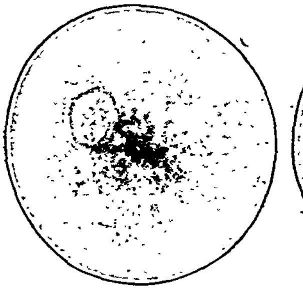

FIG. 8.

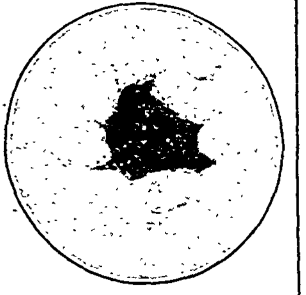

FIG. 7 (Case 2).—Syphilitic stenosis of the œsophagus (thoracic region as seen by endoscopy.

FIG. 8 (Case 2).—Two years later.

On examination he was well covered but somewhat anæmic. There was well-marked leukoplakia on the inner aspects of both cheeks, with enlarged epitrochlear glands. No other abnormality was detected on ordinary physical examination. His Wassermann reaction was found to be positive.

X ray examination with a bismuth emulsion on July 15th showed an irregular contraction of the œsophagus about four inches above the diaphragm, with some dilatation above (Figs. 5 and 6).

Œsophagoscopy was performed on July 21st, and the appearance was as shown in Fig. 7. The stenosis was 13 inches from the incisor teeth, and would admit only a very small sound. The mucosa was very red and inflamed, and bled easily. Patches of leukoplakia were seen on the inflamed surface with a small area of actual ulceration, which was thought to be malignant, and a portion was removed for microscopy. The stenosis was dilated, and a Symonds' tube left *in situ*. This was vomited two days later. Microscopic examination failed to show the presence of any malignancy, and the patient improved with occasional dilatation.

Two months later œsophagoscopy was again performed, and a second portion of the suspected growth removed for biopsy. The appearances were so strongly suspicious of malignancy that two tubes, each of 50 mg. of radium, were left *in situ* for six hours by means of an œsophageal catheter. As the second microscopic examination was also negative radium was abandoned; antisyphilitic treatment, together with regular dilatation by bougies, was commenced, and the patient improved rapidly. His antisyphilitic treatment has been continued ever since. Bougies were passed at first once a week, then once a fortnight, and then monthly, for nearly two years. The œsophagoscopic appearances as seen on July 14th, 1927, are shown in Fig. 8, and a radiogram taken at the same time is shown in Fig. 9. The patient still has a bougie passed about once every three months, and has no trouble with swallowing unless he gulps very large particles.

FIG. 9.

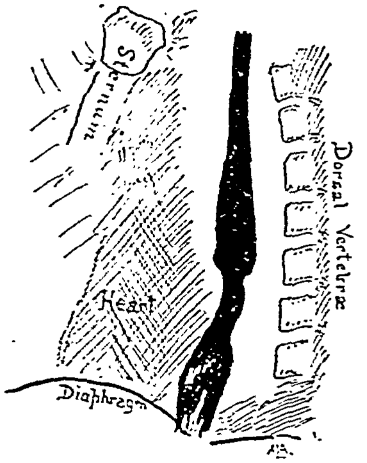

FIG. 9 (Case 2).—Diagram of radiogram of same case as Figs. 5 and 6 taken 18 months later.

The points which I wish to emphasise are: (1) Syphilis of the œsophagus is probably not so rare as a study of the literature would lead one to suspect. (2) Syphilis of the œsophagus is difficult to diagnose by vision alone, either from simple stricture or from a malignant growth. (3) One or more microscopical examinations must be made before pronouncing a case free from malignancy. (4) The patient or his relatives should not be told that he is about to die of cancer when only a specific stricture is present. Conversely, a patient with cancer of the œsophagus should not be given antisyphilitic treatment and energetic bouginage, and told that he will soon be quite normal. (5) Treatment must be by dilatation, as for any simple stricture of the œsophagus, and, in addition, very prolonged antisyphilitic treatment must be undertaken.

SKIN ANTISEPSIS WITH IODINE AND SOME NEW SOLVENTS.

By R. A. MACDONALD, M.B. EDIN., D.P.H.,
ASSISTANT PATHOLOGIST AND RESEARCH FELLOW, HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET;
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TINCTURE of iodine has long been employed for disinfecting the skin, and its uses as a skin dressing and before operation are almost universal.

Until recently rectified spirit has been the only solvent available as the chemical action of iodine on certain other solvents renders them unsuitable in every way. The extremely irritating vapours produced by the small amounts of methyl alcohol in methylated spirit make this solvent unusable. Methyl alcohol becomes oxidised by the iodine to formaldehyde and formic acid, which attack the eyes and nasal mucous membrane. It is even probable that acetic acid and other products are in course of time formed by the decomposition of ethyl alcohol with iodine, and it has been stated that old tincture of iodine has been known to burn the skin. Rectified spirit bears a very heavy duty, although the Customs and Excise grant a considerable rebate when it is used for medicinal preparations. It is on account of the heavy annual cost to hospitals that we have searched for a solvent that would replace it.

Any new solvent had to comply with the following conditions: (1) It should itself be antiseptic; (2) it should have penetrative powers when applied;

I wish most strongly to emphasise that syphilis of the œsophagus must not be diagnosed by symptoms and serological tests alone, because many patients who have carcinoma of the œsophagus have also active syphilis. As I have shown elsewhere,[1] it is most important that cancer of the œsophagus should be treated at the earliest possible moment; direct œsophagoscopic examination must, therefore, be made in all cases with symptoms of an œsophageal disease.

FIG. 1.

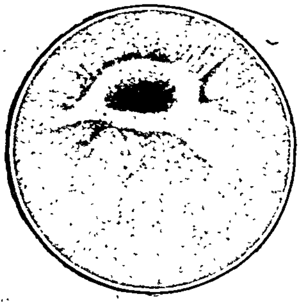


FIG. 2.

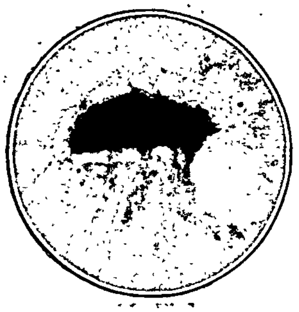


FIG. 1 (Case 1).—Syphilitic stricture of the œsophagus (cervical region) as seen through the œsophagoscope before treatment.
FIG. 2 (Case 1).—Seven days after dilatation with bougies.

Treatment.

Treatment is undertaken along two lines: (1) Antisyphilitic treatment; (2) œsophageal treatment to combat the actual or potential stenosis.

1. In acute syphilis, arsenic is administered intravenously for eight weeks, provided it has not been previously used in large quantities in the same patient. If it has, then only a shorter course of arsenic should be given. The dose varies from 0·45 to 0·6 g. in the female, and from 0·6 to 0·9 in the male, at weekly intervals. At the same time as the arsenical injection an intramuscular injection of mercurial cream or bismuth is given. At about the middle, and at the end of this course of treatment, an intramuscular injection of 0·25 g. of contramine should be given. After the last injection of contramine the patient is allowed four weeks' rest from injections and given potassium iodide grs. 5 in plenty of water, three times a day by the mouth. After this, intramuscular injections should be recommenced, and continued once a week for eight weeks. They may consist of either gr. 1 of mercury as a mercurial cream given each week, or 0·2 g. of an oily suspension of bismuth. By far the best preparation of bismuth in my experience is iodo-bismuthate of quinine (Fraisse), and this may be used with benefit alternately with the injections of mercury. After eight injections the patient is given four weeks' treatment by medicine —either potassium iodide as before, or collosol sulphur, 1 drachm three times a day; then eight weeks on a heavy metal and four weeks on a non-metal, and so on. The arsenical treatment should not be repeated.

FIG. 5.

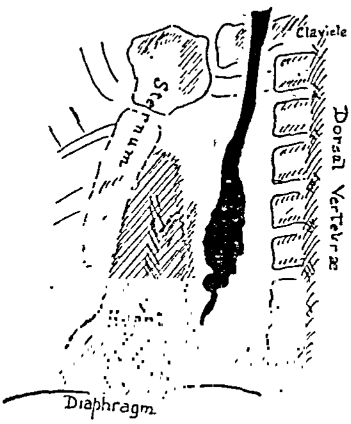
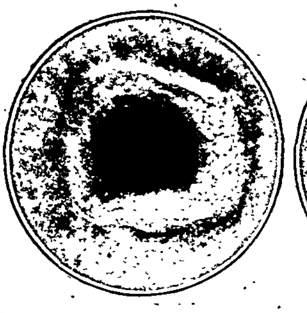


FIG. 5 (Case 2).—Diagram of radiogram of syphilitic stricture of œsophagus after swallowing radio-opaque emulsion.

In secondary syphilis this treatment should be continued for at least three years, and no notice whatever need be taken of the Wassermann reaction, whether positive or negative, during this time. In tertiary syphilis arsenic may be used, but its effect is not so good as in the early stages of the disease, and in my experience it is inferior to bismuth given as iodo-bismuthate of quinine (Fraisse). In tertiary and congenital lesions I strongly advise continuing injections of bismuth for at least four years, with four weeks' rest after each two months' injections; or alternate courses of injections may consist of bismuth for one course, mercury for the next, and so on.

FIG. 3.



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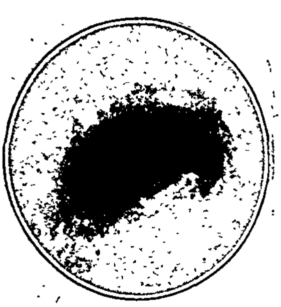

FIG. 3 (Case 1).—Two months later.
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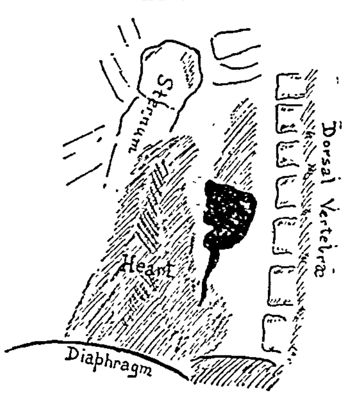

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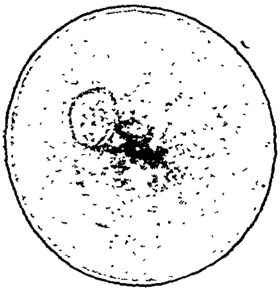

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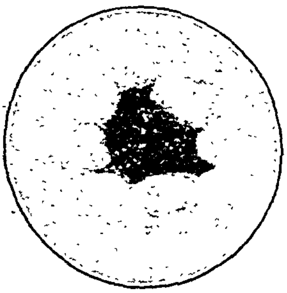

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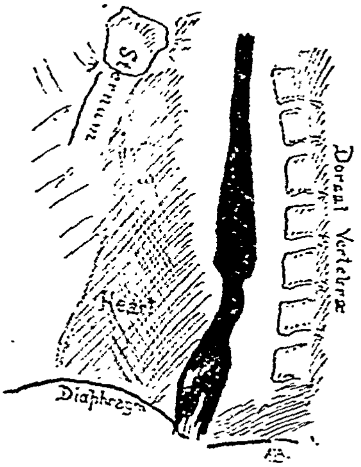

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Until recently rectified spirit has been the only solvent available as the chemical action of iodine on certain other solvents renders them unsuitable in every way. The extremely irritating vapours produced by the small amounts of methyl alcohol in methylated spirit make this solvent unusable. Methyl alcohol becomes oxidised by the iodine to formaldehyde and formic acid, which attack the eyes and nasal mucous membrane. It is even probable that acetic acid and other products are in course of time formed by the decomposition of ethyl alcohol with iodine, and it has been stated that old tincture of iodine has been known to burn the skin. Rectified spirit bears a very heavy duty, although the Customs and Excise grant a considerable rebate when it is used for medicinal preparations. It is on account of the heavy annual cost to hospitals that we have searched for a solvent that would replace it.

Any new solvent had to comply with the following conditions: (1) It should itself be antiseptic; (2) it should have penetrative powers when applied;

(3) it should not be harmful to the skin; (4) it should be stable; and (5) it should evaporate readily when painted on the skin.

Doubt has recently been expressed amongst surgeons as to whether iodine is an efficient antiseptic, and whether in the solution in general use the more important agent is not the spirit. It seemed advisable therefore to carry out some experiments to find out the actual bactericidal value of iodine in various solvents, as well as considering the relative merits of these solvents. The solvents used were as follows: Rectified spirit and ethyl alcohol, 70 per cent.; isopropyl alcohol, 90 per cent.; isopropyl alcohol, 70 per cent.; ethylene-glycol-mono-ethyl ether (for convenience hereafter called E.G.E.E.) and water with potassium iodide.

Method of Investigation.

In our investigation we made a number of solutions of iodine in other solvents, such as ether, petroleum ether, diacetone alcohol, sextone, sextol, as well as isopropyl alcohol and E.G.E.E., but it was decided that only the last two could possibly be used. Isopropyl alcohol is made from the gases emanating from petroleum wells by absorption in sulphuric acid and subsequent steam distillation. E.G.E.E. is made in the United States from ethylene obtained by "cracking" petroleum oils; the precise method does not seem to be known here. It is stated that ethyl alcohol is germicidal to *Bacillus coli* in 70 per cent. strength in two and a half minutes, and isopropyl alcohol in 30 per cent. strength in the same time. Iodine is said to kill *B. coli* in two and a half minutes in a strength of 1 in 50,000.[1] Ethyl alcohol is more active as a germicide in a strength of 70 per cent. than in any other concentration, being 30 times more powerful than 60 per cent., and 40 times more powerful than 80 per cent.[2] In our investigation the antiseptic properties of the solutions mentioned above were tested as follows: One series of experiments was made in vitro, using cultures of *B. coli* and staphylococci and the other directly on the skin to reproduce as nearly as possible the conditions obtaining at operation.

In vitro.—A measured quantity of each solution was added to an equal quantity of a 24-hour broth culture of each organism, and two drops of the mixture were abstracted by means of a sterile capillary pipette at the end of 1, 2, 3, 4, and 5 minutes. These were at once transferred to tubes containing approximately 3 c.cm. of broth and incubated over night. At the same time controls were put up containing two drops of culture and two drops of the antiseptic added separately. In the case of those solutions containing iodine this was neutralised by adding subsequently some sodium thiosulphate, in order to avoid any inhibition of growth of any organisms not killed by their period in contact with the antiseptic. (It was found later that the organisms grew perfectly in a medium containing two drops of iodine, although this gives a concentration of not less than 1 in 5000.)

On the Skin.—Areas of skin on the front of the forearm were selected, and marked off into segments with a grease pencil. As the majority of the antiseptics used had been found to be lethal to staphylococci and *B. coli* in one minute by the tube test, this period of time only was used. In each case an ordinary sterile throat swab was moistened in sterile broth and then rubbed hard on *part* of the selected area of skin. It was then transferred to a tube of broth and the latter incubated overnight. This served as a control to ensure that there were organisms on that particular piece of skin, before the addition of the antiseptic. The area of skin was then gently swabbed all over with the antiseptic in question. After one minute this area was again rubbed *all over* very thoroughly with a throat swab moistened in broth. The swab was again transferred to a tube of broth and this was incubated overnight. (N.B.—The amount of antiseptic carried over into the broth by this means must have been considerably less than the two drops used in the test-tube controls, and so in this case no further controls were added.)

Results of the Tests.

In the *tube test* growth was present in all the control tubes, but not in any case where one of the solutions had been in contact with the organisms, except ethyl alcohol 70 per cent. with staphylococci, where growth was present in all four tubes, and E.G.E.E. with staphylococci where growth was present in the first three tubes. In the *skin test* growth was present in all the control tubes, and also in all cases where the solvents had been used alone, without iodine. With none of the solutions containing iodine was any growth observed.

Isopropyl alcohol proved to be the most bactericidal of the solvents used, and no trace of irritation was noticed by either of us, after long periods of vigorous swabbing with this fluid. It is said to be twice as toxic as ethyl alcohol, but it is not absorbed to any appreciable extent by the skin or lungs.[3] The penetrative powers were tested along with the other solvents as follows:—

Areas of skin on the forearm, which had not been washed for six hours were sectioned off with grease pencil and well painted with the solution of iodine in the solvent in question, using a new camel-hair brush for each area. After the lapse of 30 minutes the forearm was swabbed with cotton-wool soaked in a 5 per cent. watery solution of sodium thiosulphate. The stains from iodine in 70 per cent. alcohol and 70 per cent. isopropyl alcohol were the most difficult to remove, the next being iodine in 90 per cent. alcohol, and the easiest being watery iodine, iodine in E.G.E.E., and iodine in isopropyl alcohol.

We had further to consider whether any decomposition would take place between iodine and the approved solvent. Isopropyl alcohol is $CH_3.CH.OH.CH_3$ and on oxidation yields acetone. We have failed to discover even a trace of acetone in our solutions of iodine in isopropyl alcohol, in bottles half full, that have been opened many times during a month. We think it would be advisable, however, in view of the possibility of oxidation, to recommend the use of comparatively recent solutions. Lastly, there is little difference between the evaporation rate of isopropyl alcohol and that of ethyl alcohol, the boiling point of the former being only 2–3 degrees higher than the latter.[3] Isopropyl alcohol, moreover, has quite a pleasant smell.

The relative costs of the solvents used in this investigation are as follows:—

Rectified spirit, after deducting the rebate allowed by the Customs and Excise, £2 13*s.* per gallon.

Isopropyl alcohol, in 10-gallon quantities, 13*s.* 6*d.* per gallon.

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Personal Observations.

In order to test further the value of the phenomenon I thought it might be of interest to carry out the test on hospital patients of different ages and affected with different types of disease. Tests were, therefore, carried out on 100 ward patients in the Glasgow Royal Infirmary. The patients were affected with the usual diseases seen in a general medical ward, and no selection was made of either patient or type of disease. The test was carried out by lightly stroking the skin of the anterior abdominal wall with the smooth rounded end of a fountain pen, due attention being paid to the details of the Sergent technique. After a few preliminary observations it was decided to record the results as follows:—

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2. *Positive* +, where there appeared a definite but not marked band of pallor.
3. *Positive* + +, where there appeared a very marked white band with clear-cut edges.

This method of recording the results is very similar to that employed by Wright. Although accurate time observations were not made, it was generally found that a positive reaction appeared in about 20 to 30 seconds and lasted for one to two minutes. The following tables show the results obtained. Of 100 cases examined, 49 per cent. gave a positive reaction (14 per cent. were positive + +, and 35 per cent. positive +), while 51 per cent. were negative.

TABLE I.—*Showing Results in Relation to Age and Sex.*

Age in years.	Sex.	P. + +	P. +	N.
10 to 20 ..	M.	0	5	3
	F.	3	6	4
21 to 35 ..	M.	6	7	3
	F.	2	8	3
36 to 50 ..	M.	1	3	12
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Over 50 ..	M.	0	4	16
	F.	0	0	6

P. = Positive. N. = Negative.

An examination of Table I. shows that a positive reaction was obtained far more frequently under 35 years of age than over. This is in accordance with the results obtained by other observers. Thus, Kay and Brock[4] state that the white line occurs most frequently in young adults of either sex. In my series, in 29 patients between the ages of 21 and 35 years, 79·3 per cent. gave a positive reaction, while in 50 patients between the ages of 36 and 74 years, only 24 per cent. were positive.

TABLE II.—*Showing Results in Relation to Type of Disease.*

Disease.	P. + +	P. +	N.	Disease.	P. + +	P. +	N.
Gastro-intestinal	1	9	14	Diabetes m. ..	1	3	2
Respiratory ..	2	7	15	Blood	0	0	4
Exophthalmic goitre	4	0	1	Renal	2	5	4
Rheumatic ..	0	2	2	Cardiac	2	4	3
				Nervous ..	2	4	3
				Miscellaneous	0	1	3

Diabetes m. = Diabetes mellitus.

The only criticism I have to offer on these results given in Table II. is that in four cases of exophthalmic goitre the reaction was obtained in a very marked degree; in fact, they showed a white band more intense than that obtained in any other disease. This tends to support the hypothesis formulated by Tracy[5] that the white line is a manifestation of sympatheticotonia.

TABLE III.—*Showing Results in Relation to Blood Pressure.*

—	P. + +	P. +	N.
Average systolic pressure ..	119	117	122
Average diastolic pressure ..	69	72	73
Average pulse pressure	50	45	49

A glance at Table III. shows that no definite relationship can be demonstrated between blood pressure or pulse pressure and type of reaction.

Conclusions.

As a result of these observations and from the reports published by other investigators it would appear that (1) the white line of Sergent is a phenomenon which may be readily demonstrated in a large percentage of young adults; (2) it bears no relationship to the sex of the individual; (3) it bears no relationship to the blood pressure and is not pathognomonic of adrenal insufficiency; (4) it bears no relationship to any particular type of disease, although

(3) it should not be harmful to the skin; (4) it should be stable; and (5) it should evaporate readily when painted on the skin.

Doubt has recently been expressed amongst surgeons as to whether iodine is an efficient antiseptic, and whether in the solution in general use the more important agent is not the spirit. It seemed advisable therefore to carry out some experiments to find out the actual bactericidal value of iodine in various solvents, as well as considering the relative merits of these solvents. The solvents used were as follows: Rectified spirit and ethyl alcohol, 70 per cent.; isopropyl alcohol, 90 per cent.; isopropyl alcohol, 70 per cent.; ethylene-glycol-mono-ethyl ether (for convenience hereafter called E.G.E.E.) and water with potassium iodide.

Method of Investigation.

In our investigation we made a number of solutions of iodine in other solvents, such as ether, petroleum ether, diacetone alcohol, sextone, sextol, as well as isopropyl alcohol and E.G.E.E., but it was decided that only the last two could possibly be used. Isopropyl alcohol is made from the gases emanating from petroleum wells by absorption in sulphuric acid and subsequent steam distillation. E.G.E.E. is made in the United States from ethylene obtained by "cracking" petroleum oils; the precise method does not seem to be known here. It is stated that ethyl alcohol is germicidal to *Bacillus coli* in 70 per cent. strength in two and a half minutes, and isopropyl alcohol in 30 per cent. strength in the same time. Iodine is said to kill *B. coli* in two and a half minutes in a strength of 1 in 50,000.[1] Ethyl alcohol is more active as a germicide in a strength of 70 per cent. than in any other concentration, being 30 times more powerful than 60 per cent., and 40 times more powerful than 80 per cent.[2] In our investigation the antiseptic properties of the solutions mentioned above were tested as follows: One series of experiments was made in vitro, using cultures of *B. coli* and staphylococci and the other directly on the skin to reproduce as nearly as possible the conditions obtaining at operation.

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On the Skin.—Areas of skin on the front of the forearm were selected, and marked off into segments with a grease pencil. As the majority of the antiseptics used had been found to be lethal to staphylococci and *B. coli* in one minute by the tube test, this period of time only was used. In each case an ordinary sterile throat swab was moistened in sterile broth and then rubbed hard on *part* of the selected area of skin. It was then transferred to a tube of broth and the latter incubated overnight. This served as a control to ensure that there were organisms on that particular piece of skin, before the addition of the antiseptic. The area of skin was then gently swabbed all over with the antiseptic in question. After one minute this area was again rubbed *all over* very thoroughly with a throat swab moistened in broth. The swab was again transferred to a tube of broth and this was incubated overnight. (N.B.—The amount of antiseptic carried over into the broth by this means must have been considerably less than the two drops used in the test-tube controls, and so in this case no further controls were added.)

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Areas of skin on the forearm, which had not been washed for six hours were sectioned off with grease pencil and well painted with the solution of iodine in the solvent in question, using a new camel-hair brush for each area. After the lapse of 30 minutes the forearm was swabbed with cotton-wool soaked in a 5 per cent. watery solution of sodium thiosulphate. The stains from iodine in 70 per cent. alcohol and 70 per cent. isopropyl alcohol were the most difficult to remove, the next being iodine in 90 per cent. alcohol, and the easiest being watery iodine, iodine in E.G.E.E., and iodine in isopropyl alcohol.

We had further to consider whether any decomposition would take place between iodine and the approved solvent. Isopropyl alcohol is $CH_3.CH.OH.CH_3$ and on oxidation yields acetone. We have failed to discover even a trace of acetone in our solutions of iodine in isopropyl alcohol, in bottles half full, that have been opened many times during a month. We think it would be advisable, however, in view of the possibility of oxidation, to recommend the use of comparatively recent solutions. Lastly, there is little difference between the evaporation rate of isopropyl alcohol and that of ethyl alcohol, the boiling point of the former being only 2–3 degrees higher than the latter.[3] Isopropyl alcohol, moreover, has quite a pleasant smell.

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reparation of the Medium.

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aseptic precautions. For trypsinisation, to
of blood add 0·2 c.cm. of liquor pancreaticus
e treated blood is left overnight (18–24 hours)
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made with meat extract and adjusted to the
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iquor pancreaticus to every 8 c.cm. of broth,
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which the broth should remain clear. The milk
milarly prepared and should show practically
reaction. After being trypsinised the three
ll mixed with the beaten egg, and the whole
rained through gauze or muslin and distributed
ese are sloped in an inspissator, so heated as to
urs to reach 75° C., at which temperature they
15–30 minutes before being autoclaved at
0 minutes.

Growth of Various Organisms.

medium the growth of the tubercle bacillus
t body heat. In subculture the minute
somewhat raised above the surface and
sible to the naked eye, soon become con-
l nodular in appearance. Examined micro-
the organisms present marked pleo-
, some appearing as beaded bodies 15–20 μ
, a few of them so disposed as to give the
ce of a chain of streptococci. Here and
one or both ends of the organism, detached
pear as minute cocci. Other organisms are
irregularly disposed rounded bodies, as small
elitensis.

pneumococcus grows very rapidly on the
. When sown from a loopful of a thin emul-
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ours an abundant growth of colonies which in
hours become flattened out, appearing as
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for many weeks, if evaporation is prevented.
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sometimes it may be specially marked in certain pathological states not connected with adrenal insufficiency.

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NON-SPECIFIC PROTEIN THERAPY IN ERYSIPELAS.

By Henry C. Semon, M.D. Oxf., M.R.C.P. Lond.,

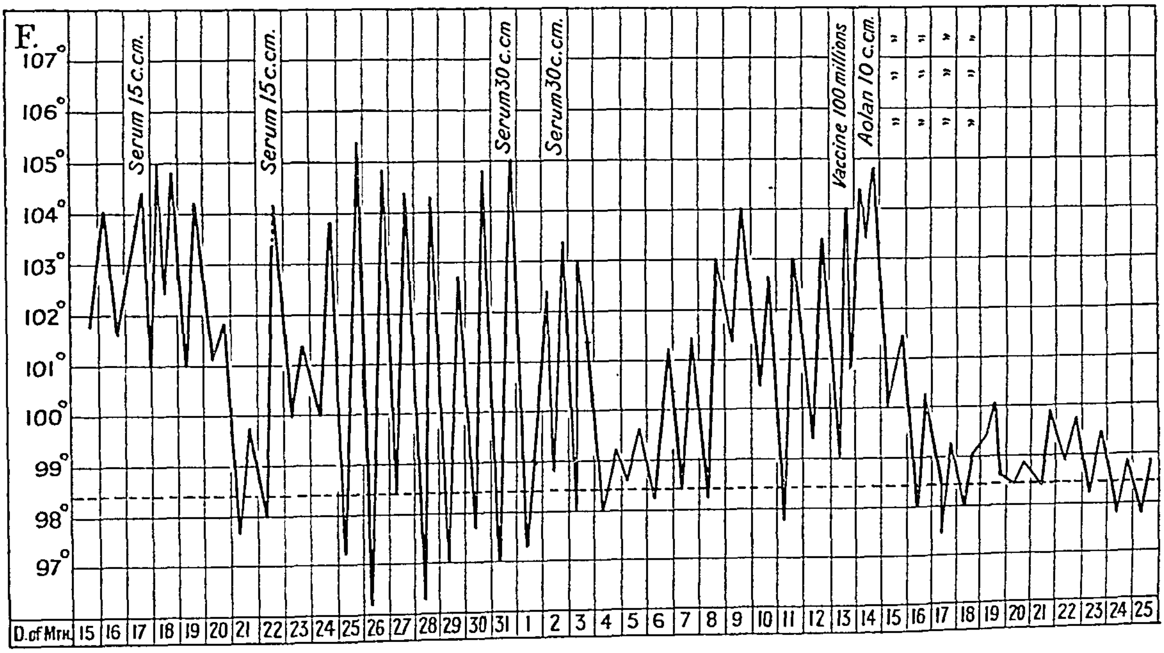
PHYSICIAN, DISEASES OF THE SKIN, ROYAL NORTHERN HOSPITAL.

THE respective potencies of specific as opposed to non-specific protein therapy, both of acute and chronic infections, are still sub judice, and the adherents of the former doctrine could doubtless produce examples in support of their contentions as striking as the one here submitted. The writer holds no fixed views in the controversy; his object is merely to call attention to a very harmless and sometimes exceedingly effective means of stimulating to their utmost capacity the natural protective mechanisms against disease.

A middle-aged married lady had suffered from an aural furunculosis for about three months. On May 15th last, on her return from the seaside, she appeared to have caught a chill, and on the following day at noon she went to bed with a temperature of 102° F. She complained of deafness and a feeling of fullness over the right ear and cheek. On the 17th an erysipelatous eruption appeared in those situations, and during the course of her illness in the following weeks wandered over the scalp and the rest of the face in an irregular manner. Each extension appears to have been associated with rigors and increase in the temperature.

An injection of antistreptococcal serum was given on May 17th, but there was no fall in temperature until May 21st. A second injection, given on the following day, appeared to have some effect, but doubled doses on the third and fourth days produced no result. Two attempts to grow the organisms from the blood were unsuccessful, and the injection of a stock vaccine on June 13th appears to have been followed by an even higher temperature, almost 105°.

The patient was very ill indeed when I was asked to see her in consultation on June 14th, the thirty-first day of her infection. She had a running pulse of 130, a temperature of 105°, and was almost comatose. It was very difficult to rouse her, and there was complete loss of control of the sphincters. The erythematous rash on the scalp and face was slightly œdematous in places, but had not the typical sharply defined raised edge of text-book descriptions. Nevertheless, the rest of the picture left no doubt of the nature of her infection. My first suggestion, to give an intravenous injection of gr. 1/16 of perchloride of mercury, was opposed by one of the consultants on the ground that she had mitral stenosis and probably some valvular vegetations, which he believed he had seen detached by this procedure in another case. No objections were raised to the intramuscular injection of 10 c.cm. of aolan, a germ- and toxin-free derivative of cow's milk, which is put up in 5 and 10 c.cm. ampoules by the firm of Beiersdorf, in Hamburg. The injection was made into the buttocks, 5 c.cm. intramuscularly, and another 5 c.cm. into the fascial planes over the glutei. No harmful effects were observed at the time, and that same evening the temperature fell to 101°. 10 c.cm. were given on the three following days, and 5 c.cm. on June 17th and 18th. The effects on the temperature are well illustrated by the chart, and the improvement in the general condition proceeded pari passu with the fall of temperature. The eruption on the scalp and forehead did not appear to be influenced to the same extent, but this was at no time a very striking feature of the case, and gradually involuted under local applications of a weak solution of ichthyol and lead.



Temperature chart of a case of erysipelas, showing improvement under the influence of aolan.

The recovery was so striking that the case seems worthy of record.

A NEW CULTURE MEDIUM.

By C. Y. Wang, M.D., F.R.C.P. Edin.

(From the School of Pathology, University of Hong-Kong.)

THE following preparation is the outcome of a series of experiments I have had occasion to conduct, whilst studying certain aspects of the biological properties of bacteria, for the purpose of raising early and abundant growth :—

Trypsinised defibrinated ox blood	10 parts.
,, plain bouillon	8 ,,
,, plain milk medium	4 ,,
Beaten whole egg	10 ,,

Preparation of the Medium.

The defibrinated blood should be fresh, but need not be obtained with aseptic precautions. For trypsinisation, to every 10 c.cm. of blood add 0·2 c.cm. of liquor pancreaticus (Benger's). The treated blood is left overnight (18–24 hours) at 37° C., but should be occasionally shaken during the first few hours of incubation. The bouillon is the ordinary peptone broth made with meat extract and adjusted to the usual reaction. Trypsinisation is effected by adding 0·16 c.cm. of liquor pancreaticus to every 8 c.cm. of broth, leaving to stand overnight at body temperature. Strict aseptic precautions are to be observed in this procedure, at the end of which the broth should remain clear. The milk medium is similarly prepared and should show practically no change in reaction. After being trypsinised the three fluids are well mixed with the beaten egg, and the whole mixture is strained through gauze or muslin and distributed in tubes. These are sloped in an inspissator, so heated as to take 3½–4 hours to reach 75° C., at which temperature they remain for 15–30 minutes before being autoclaved at 120° C. for 20 minutes.

Growth of Various Organisms.

On this medium the growth of the tubercle bacillus is rapid at body heat. In subculture the minute colonies, somewhat raised above the surface and plainly visible to the naked eye, soon become confluent and nodular in appearance. Examined microscopically the organisms present marked pleomorphism, some appearing as beaded bodies 15–20 μ in length, a few of them so disposed as to give the appearance of a chain of streptococci. Here and there, at one or both ends of the organism, detached beads appear as minute cocci. Other organisms are seen as irregularly disposed rounded bodies, as small as *B. melitensis*.

The pneumococcus grows very rapidly on the medium. When sown from a loopful of a thin emulsion, scarcely turbid to the naked eye, it yields in 12–16 hours an abundant growth of colonies which in 24–36 hours become flattened out, appearing as glossy patches. The organism tends to retain its viability for many weeks, if evaporation is prevented. The growth far surpasses that obtained on other media, such as blood-agar or solidified serum.

The streptococcus thrives extremely well. Unlike those of the pneumococcus, the colonies do not tend to flatten out.

The diphtheria bacillus develops readily; at 12–24 hours after incubation the colonies are more numerous than those seen on Löffler's serum.

The medium has also been found favourable for the growth of other bacteria, such as the meningococcus, hæmophilic bacilli, and the organisms of glanders and plague.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.—The annual report states that the new buildings at the country branch at Brockley Hill, Stanmore, are now occupied and provide 90 additional beds, with an operating theatre and other accommodation. There are now 214 beds at Stanmore, and the King's Fund has promised a further £1000 towards the provision of another 50 beds there. An additional 70 acres of land have been purchased which will not only provide for future extensions, but will ensure the maintenance of the rural character of the hospital.

FLORENCE NIGHTINGALE FUND.—The annual report of the Florence Nightingale Fund School at St. Thomas's Hospital states that last year there were 156 probationer nurses under training. Of these, 70 were taken on as extra nurses to complete their training, 37 completed their term and received certificates, and only 13 resigned or were discharged as unsuitable. The fund was raised after the Crimean war in recognition of Miss Nightingale's services and has an income of £2000 a year. It claims to give the best training a nurse can receive, and, owing to the demands upon the staff for important outside posts, the matron has been compelled for the moment to refuse to allow further drafts to be made upon it.

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In another paper Dr. Bigger dealt with the bacteriological control of shell-fish, describing a method adopted by him for determining the fitness of shell-fish for human consumption, which was essentially a modification of Klein's. He referred to the discordance between the results obtained by him acting for the Department of Fisheries and those obtained by Prof. J. W. Eyre for the Fishmongers' Company. He believed that the divergent results were chiefly due to chance in the selection of shell-fish and chance in the selection of the particular fraction of shell-fish fluid examined. He thought his own method gave more reliable and just as rapid results as the Houston-Eyre method.—The desirability of the adoption of a uniform standard was brought out by the discussion.

Dr. Geoffrey Bewley (Adelaide Hospital, Dublin), in a paper on the Schick test, showed that the mortality from diphtheria had always been smaller in Ireland than in England and Scotland. The rates in England and Scotland, however, had recently been greatly reduced, whilst that in the Free State had been practically stationary. The number of Schick reactors was probably proportionately greater in the Free State than in England. In the Adelaide Hospital 54 per cent. of the nurses were positive, as compared with an average figure of 25 per cent. for English hospitals. From this he inferred that the soil was prepared, and that diphtheria might at any time assume epidemic proportions in the Free State. The prophylactic inoculation of the children was, therefore, worthy of consideration.

Prof. Blair Bell (Liverpool) claimed that the clinical results of combination of the lead and X ray therapy for cancer is better than those obtained from either alone. He reviewed their 1925 statistics in the light of subsequent history. Of 31 cases which were believed to be cured 3 had since died, 2 from intercurrent disease, and 1 from recurrence. The remainder were alive and healthy.—Dr. Leslie Cunningham described the toxic effects of intravenous lead and emphasised the need for careful study of the variation in functions of the liver during the treatment.

Section of Child Welfare.

Prof. A. Louise McIlroy (London), in her presidential address on the Progress of Midwifery in the Present Century, referred to Dublin as the Mecca of obstetrics. Bedside teaching in the three great hospitals was given by experts. There had been much advance in antenatal work between 1900 and 1925. Obstetrics, once the Cinderella of medicine, raised to a science, would promote the dignity of motherhood and the saving of child life. She referred gratefully to the pioneer work of Ballantyne, of Edinburgh, and proceeded to deal with changes wrought by antenatal supervision. Disease in expectant mothers was now treated as disease complicated by pregnancy rather than pregnancy complicated by disease. Wonderful results had accrued from the work of a special heart clinic for pregnant women at the Royal Free Hospital. Rational treatment had been introduced for eclampsia to take the place of induction of labour and high forceps cases with their great mortality. To this change Dr. Hastings Tweedie, of Dublin, had contributed much. Research had been promoted as to the normal and the abnormal. Decayed teeth might give rise to eclampsia and toxic symptoms, therefore the work of a dental clinic for expectant mothers was extremely important. X ray examination was invaluable for removing doubt as to pregnancy, &c., though some might question the advantage to the mother of learning a few months beforehand of the advent of triplets, against which risk insurance companies had now refused to insure. Practice was taking the place of lectures in the teaching of medical students. There should be, now, few emergencies in homes unsuitable for complicated labour. The spreading of this knowledge would help the cause of better housing and the demand for more skilled attention for mothers. Hurried labours should become a thing of the past. She had found gas and oxygen the ideal anæsthetic for labour and, in reply to a question, mentioned that a portable apparatus for the purpose was being worked out with promise of success. Although there was as yet little improvement in sepsis mortality, septic morbidity was becoming less. For sepsis she used glycerine drainage with vaccines and open-air treatment. Hopeful research as to vaccines was in progress based on the Dick tests. She believed in serum rather than autogenous vaccine. Since the draining of the uterus by glycerine had been introduced, the douching of the uterus and vagina had been discarded, but in certain cases intestinal lavage was good. The treatment of venereal disease in pregnancy prevented the birth of syphilitic babies and gonorrhœal ophthalmia. Through postnatal clinics and preventive midwifery they would ultimately have more maternity and fewer gynæcological beds, as 50 per cent. of the gynæcological beds were at present filled by conditions due to bad or meddlesome midwifery. The sacrifice of the child by induction of labour was very seldom necessary. Hyperemesis and retroversion of the gravid uterus ought not to be, as formerly, common causes of abortion. In seven and a half years in the Royal Free Hospital they had had no case of craniotomy, owing to improved Cæsarean technique or antenatal work. Subsequent normal labour might occur after Cæsarean section with the scar still holding. The same antenatal care was good for both mother and child. Considering its aims, obstetrics was the greatest subject in medicine, and the new teaching must be spread to the Connemara mothers.

The claims made by Dr. McIlroy for antenatal treatment received ample confirmation in later papers.—Dr. Louis Cassidy (Master, Coombe Hospital) pointed out that 30 per cent. of pregnant women needed much care throughout pregnancy. Early abortion was preventable. In seven years at the Coombe they had only had two deaths from pernicious vomiting and both these cases were moribund on admission. By early treatment with rest in bed and a suitable vitamin-rich diet much could be done to avert fœtal death and trouble from kidney disease. Contraction of the pelvis was becoming rarer. In the prevention of autogenous sepsis attention to septic teeth, the nasopharynx, and the bladder were important. There should be no vaginal examination in normal cases. For the education of the medical student three months' residence in a maternity hospital should be required. Obstetricians should make a more determined effort to secure representation on the General Medical Council. Preventive midwifery would abolish craniotomies and make Cæsarean sections comparatively rare. Women must be persuaded to go early to the antenatal clinics.

Dr. N. Falkiner mentioned that at the Rotunda, breech presentations were only rectified if this could be done easily by external versions. They had had living babies in all their last breech deliveries.—Dr. A. W. Spain (National Maternity Hospital) considered that there were good antenatal facilities for the poor and, he believed, the rich also availed themselves of antenatal advice, but the middle class did not. They must educate the public through the medical officers of health.—Dr. Bethel Solomons (Rotunda) thought that antenatal clinics should only be held at maternity hospitals. Every woman should have antenatal care and the private practitioner's fee should include this. He criticised severely the rule of the Central Midwives Board making vaginal examinations by midwives compulsory. The rectification of breech presentations might result in the death of the baby by the twisting of the cord and give rise to the separation of the placenta. He believed that the results obtained in the maternity hospitals of Scandinavia and Dublin were the best in the world.—Dr. G. W. Fitzgerald (Manchester) advocated that part of the improved training of the medical student should be post-graduate. He emphasised the fact that the theory of autogenous infection was a dangerous doctrine. Other points made were that antenatal clinics, if not always held at maternity hospitals, should at any rate be conducted by experts, and that, if possible, the confinements should be conducted by those who had done the antenatal examinations.

The discussion brought out the fact that two-thirds of the births in Dublin were attended through the intern and extern departments of the three hospitals, and a resolution was passed requesting the masters to consider the preparation of statistics on a considerable scale which would establish the value of antenatal work.

School Medical Service.

Dr. J. A. Harbison (Kildare), after describing the aim of preventive medicine as medical "supervision from conception to corruption," went on to show what gaps needed to be filled. They wanted nursery schools like the McMillan to teach habits to the toddler, and they wanted health education for older scholars.—Dr. T. S. Fulton (Belfast) emphasised the unhygienic condition of many of the schools. In Belfast they had much leeway to make up. Out of 186 schools only seven were really good. They were endeavouring to renovate five every year at a cost of about £30,000, and expenditure on nursery schools was at present starved out in Belfast, though the need for them was recognised.—Both speakers deprecated hurried examinations and the undue importance attributed to statistics. The need for the education of the public and of education authorities in the wide difference between a nursery school and the ordinary infants' department of an elementary school was emphasised in the discussion.

Dr. A. Dingwall Fordyce described the beginning made in Liverpool in the supervision of the rheumatic school-child by means of a hospital clinic coöperating with the public medical services. Many more residential beds and convalescent homes were needed on Merseyside for this work. Head-teachers should be fully notified how to deal with each rheumatic child.—Dr. Catherine Chisholm (Manchester) from her experience said that rheumatic febrile attacks in the 1–5 age period could be discovered if sought for.—Dr. Letitia Fairfield described the scheme for rheumatic children carried out by the coöperation of Guy's Hospital. They had special classes in the "physically defective" schools for such cases and taught them a suitable trade from 12 years old onwards. An important point made in the discussion was that school medical officers, like tuberculosis officers, should be in some way attached to hospitals and thus given a wider clinical field. Dr. Fairfield gave an extremely interesting account of the working of the L.C.C. scheme for mentally defective children, and in replying to a vigorous discussion she said there had been no dull and backward in the London M.D. schools during the last ten years. She further said that mongols were admitted to the M.D. schools, but that their education was a waste of money. She wished something could be done to correct the impression that thyroid was beneficial to mongols, as absolutely fallacious hopes were aroused in parents. Modern opinion was dead against sterilisation. Those for whom sterilisation was justifiable also needed confinement.

OTHER SECTIONS.

Some 80 contributions, a large proportion of which were from representatives of the Free State, official and non-official, were discussed at the five sections and their various subsections.

Prof. P. Abercrombie (Liverpool) dealt with town and rural planning, and referred to the modern anti-social phenomenon of "ribbon" building. He advocated instead the grouping of houses on side roads at right-angles to the main artery, so as to secure compact communities.—Mr. J. Webb (President of the Royal Institute of Architects of Ireland) pressed the urgency of planning for all the towns and rural areas of Ireland.—Mr. George Beckett (Vice-President R.I.A.I.) said his institute has been pressing the Government during the last five years for planning measures. He believed that the city commissioners were quite alive to the importance of planning but that the Government was not.—Dr. W. C. Dwyer (one of the three Dublin commissioners) pointed out the urgent need for town planning in Dublin, and emphasised the disastrous effect of bad housing on education.—Mr. Manning Robertson, M.R.I.A.I., said that Ireland lagged hopelessly behind the Continent in town and regional planning, and that a comprehensive planning Act was needed. Fortunately for Ireland, he said, they had not inherited the legacy from uncontrolled industrialism that was the despair of England's housing reformers. He moved a resolution, which was accepted by the section, recommending the Government to set up a planning commission for the development of the Free State as a whole.—Mr. W. J. Byrne (Dublin Commercial Utility Society) showed how much could be done by utility societies if the local authorities throughout the Free State would grant to them the facilities provided for under the various housing acts.—Mr. H. T. O'Rourke (city architect) outlined the activities of the Dublin Corporation. Modern methods of dealing with the housing problem in the congested areas of old towns were so hopelessly uneconomic that he had practically reached the conclusion that free housing was as necessary as free education.—It was clear from the discussion that the spoiling of the country-side, although it had not reached so advanced a stage as in England, was quite sufficient of a menace in the Free State to provoke vigorous protests. In order to deal with this menace Mr. R. M. Butler (Professor of Architecture, University College, Dublin) urged that "committees of taste," composed of architects, artists, road engineers, and business men should be set up in every district.

Dr. Gerald Leighton (Scottish Board of Health) advocated a great extension of the fixing of standards for foodstuffs.—Mr. J. H. Norris (Director of Veterinary Research) estimated that 20 per cent. of the Irish dairy cattle were tuberculous and strongly supported the recommendations of the Free State Interdepartmental Committee, which included veterinary inspection of dairy cattle, the extension of the tuberculosis order, and the grading of milk.—That the Free State will be able to profit by our experience and secure a better nomenclature for graded milks was pointed out by Mr. J. McAllan (Chief Veterinary Inspector, Aberdeen).—A joint contribution from Dr. E. G. Gibb-Smith (M.O.H., Teddington) and Dr. F. Hobday (Principal, Royal Veterinary College) drew attention to the unsatisfactory form of bottle used for milk and to its inefficient capping. The authors also suggested the possibility of destructible containers for milk.

Dr. P. C. Varrier-Jones, in his presidential address, referred to the failure of sanatoriums to cure tuberculosis. Sanatorium treatment only touched the fringe of the matter. The crux of the question was the provision of suitable employment under sheltered conditions with facilities for treatment when required. Village settlements, such as Papworth, fulfilled these requirements.

A Tunbridge Wells Centenary.—The centenary of the Tunbridge Wells General Hospital was observed during the week ended August 18th, when funds were raised towards the £100,000 needed for the building of a new hospital at Great Culverden, Mount Ephraim. In 1926 the governors agreed to mark the centenary by beginning the erection of a new building, instead of spending many thousands of pounds in extensions. The new hospital, which will have 150 beds, will combine the eye and ear hospital, now in its fiftieth year, and a considerable portion of the £100,000 needed will accrue from the sale of the two sites. Building is to be started in a few months.

Reviews and Notices of Books.

FROM MAGIC TO SCIENCE.

By CHARLES SINGER, M.D., D.Litt. Oxf., F.R.C.P. Lond. London: Ernest Benn, Ltd. 1928. Pp. 253. *25s.*

THESE essays deal with what their author terms poetically "the scientific twilight," and have all been printed at various times during the last ten years. But as they are scattered through various publications, some of which are not easily accessible, and as they represent a continuous development of a single line of thought, Dr. Singer has been well advised to bring them together with such modifications from the original form as later publication warranted. We have thus set out what may be called the story of early accomplishment in natural philosophy, as human knowledge groped its way from myth to something of exactitude.

The first essay briefly describes science under the Roman Empire. The author shows the superficial nature of the resemblance of the Lucretian theory to modern atomic views, and gives proper credit to Pliny and Seneca as the two founts of ancient Roman learning whose written works were not lost during the dark ages. Pliny's credulity, however, in medical matters deserves the exposure which it receives. The position of Celsus is accurately described, with much interesting information on the Roman hospital system and the growth of hygienic ideas from prehistoric times. The "Dawn of Science," the subject of the second essay, receives no particular date, but Dr. Singer suggests that we may fix the end of Antiquity and the beginning of the Middle Ages for science at the end of the fourth or the beginning of the fifth century. The lowest degradation of the human intellect in Europe generally may be placed in the tenth century, after which a slow ascent can be discerned. By the thirteenth and fourteenth centuries there is considerable expansion of natural knowledge, and Dr. Singer places the limiting date of the mediaeval attitude towards nature as 1543, and gives his reasons in great detail, which should be read in connexion with an informing chronological pedigree of mediaeval science. Three hundred years earlier the first truly scientific wave which our comparatively modern world experienced marked the arrival of Roger Bacon, while it need hardly be said that Leonardo da Vinci, Paracelsus, and Vesalius are in the pedigree, the last named being contemporary with the critical year. A chapter on the Lorica of Gildas the Briton introduces a subject of medical interest which will be novel to most readers. The lorica was literally a coat of mail, but the word was used for religious spells or invocations of a protective character. The most famous of the loricæ was that attributed to St. Gildas, which is Celtic in character and of date about 600—there is doubt about the exact period. It appeals to the Trinity and to the Hosts of Heaven in 47 stanzas which form a catalogue of the various parts of the body, and lest the compiler should have omitted any part he asks that other members of the body should be held to cover the names of which he has perchance left out. As the chief interest in the Lorica of Gildas is the extraordinary vocabulary of foreign words, the origin of many of which are obscure, Dr. Singer adds very full notes on them which, as he explains, give an idea of how, at certain cultural stages, any phrase or idea that is foreign or strange can be enlisted by the magician for his purposes. An appendix to the chapter describes the six known manuscripts of the Lorica of Gildas, one of which is in the British Museum and forms mainly the text for the essay. In the last essay, which deals with some of the legends which gathered round the school of Salerno, Dr. Singer questions the suggestion that that centre of learning gave free access to women, and states how one of its alleged female celebrities, Trotula, was none other than a man—one Trottus—and that Trotula passed long ago into the fairy tales as Dame Trot. Thus fades into nothingness, he says, the first woman professor whose life a learned medical historian, Salvatore De Renzi, once essayed to write in his Collectio Salernitana.

We have to thank Dr. Singer for a learned, amusing, and suggestive book, and one of special interest to medical men inasmuch as from our science most of the examples of evolutionary knowledge are taken. The illustrations are an interesting feature of the volume.

SOME PRINCIPLES OF DIAGNOSIS, PROGNOSIS AND TREATMENT.

A Trilogy. By ROBERT HUTCHISON, M.D., F.R.C.P., Physician to the London Hospital. Bristol: John Wright and Sons, Ltd. 1928. Pp. 54. *2s. 6d.*

WHENEVER Dr. Robert Hutchison gives an address his audience may expect something interesting, witty and sound. This little book could be bought and read with profit by every specialist and general practitioner, young and old, in the land. In the specialist Dr. Hutchison's broad outlook should help to preserve a mental balance which is sometimes in danger; to the young general practitioner the practical principles he lays down are invaluable; while the older man will chuckle as he sees Dr. Hutchison put into pithy sentences the conclusions which he has himself arrived at by experience but has been unable to formulate. The book contains three addresses, two of which are reprinted from weekly medical journals, while the third is taken from the author's book on "The Elements of Medical Treatment."

In his preface Dr. Hutchison says that his object is to repeat and emphasise the elementary principles of diagnosis, prognosis, and treatment, which are in danger of being ignored through the rapid advances of modern medicine on the laboratory side. It is not that Dr. Hutchison despises modern methods, but he is anxious to show that medicine is and must remain an art, and that our duty is not finished when we have put an appropriate label on the symptoms. In diagnosis the author comments on the three faculties which are called into play—observation, knowledge, and judgment, and gives a list of "don'ts." Prognosis he characterises as the branch of medicine which has, perhaps, made least progress since the time of Hippocrates, and he discusses most admirably the vexed question of "What the patient should be told." Treatment is discussed under appropriate headings, and Dr. Hutchison emphasises the importance of paying attention to the patient's likes and dislikes, quoting Sydenham to the effect that "more importance is to be attached to the desires and feeling of the patient, provided that they are not excessive or dangerous, than to doubtful and fallacious rules of medical art."

CHILDBIRTH.

By WILLIAM GEORGE LEE, A.B., M.D. University of Chicago Press. 1928. Pp. 300. *15s.*

THE manuscript of this book was completed just before the death of the author. It consists of the personal views of a leading American obstetrician not only on the theory and practice of obstetrics, but also on what he considers to be the ideal method of organising the maternity service of a country. Some of his ideas on organisation are excellent; others will receive little sympathy in this country. The following passage is hardly likely to represent current American or British opinion. "The midwife still persists to-day as an evolutionary remnant in our midst, although, like the vermiform appendix, she is now of concern chiefly because of the great amount of harm she originates, her essential functions having long since been lost.” The author possesses the power of explaining difficult points in the simplest language. Only 50 pages are devoted to normal labour, but the whole process could be readily understood by an intelligent lay reader; yet few experienced obstetricians would fail to derive benefit from reading the account. A long and careful survey is given of the reasons for interfering with the course of labour; under this heading are grouped such various conditions as hæmorrhage, contracted pelvis, and malpresentations. This is a mistake from the student's point of view, since the characteristic features of each of these abnormalities are not clearly set out. The procedures recommended are in the main orthodox, but the author's recommendation of uterine tamponade as a routine after manual removal of the placenta is unusual. Dr. Lee gives a full account of the Kjelland forceps; he considers this instrument the best for general purposes.

The book will be of interest mainly to those who already have a fair amount of experience in obstetrics.

Gastro-intestinal Diseases.

Lectures delivered at the James Mackenzie Institute for Clinical Research. London: Humphrey Milford, Oxford University Press. 1928. Pp. 278. *10s. 6d.*

THE collection of articles which form this volume consists of lectures delivered at the James Mackenzie Institute at St. Andrews during the winter session of 1927. Containing as it does the views of 11 eminent British authorities, together with discussion of their opinion by no less eminent critics, the volume is more than readable; it becomes practically a treatise on many unusual problems in connexion with the alimentary canal. We would call attention particularly to the article by Dr. E. Matthew on hæmatemesis, and that by Prof. D. P. D. Wilkie on gallbladder disease as being models of what advanced lectures should be. The article by Prof. John Fraser on superficial pain as an aid in the differential diagnosis of abdominal disease is of the thoughtful and deeply informed nature which one is accustomed to expect from this authority.

The volume should receive a ready welcome from all practitioners whose interest in their profession is sufficient to persuade them not to neglect the use of books.

Neurobiology.

Handbuch der biologischen Arbeitsmethoden. Edited by Geh. Med.-Rat. Prof. Dr. EMIL ABDERHALDEN. *Neurobiologische Studien am menschlichen Fœtus.* By M. MINKOWSKI. Zürich. *Methoden der Reflexprüfung beim Menschen.* By ARTHUR BÖHME. Bochum. Abt. V., Teil 5B, Heft 5. With illustrations. Berlin and Vienna: Urban and Schwarzenberg. 1928. Pp. 511–692. Mk.10.

Prof. Minkowski deals with a hitherto relatively unexplored field of neurophysiology, the material for the study of which is bound to be meagre and difficult to come by. Most if not all of it has been obtained by the help of colleagues, who have given him living fœtuses procured during Cæsarean operations. The viability of such organisms being dubious and in the majority of instances certainly brief, Prof. Minkowski has found it essential to form beforehand a clear idea of the exact experiments to be made and the time limits to be imposed for these, in each particular case: full details of his technique are supplied. Working along these lines, he has been able to cover a surprising amount of the field of antenatal neurophysiology. His experiments have been directed towards investigation of the origination of movements in the fœtus; whether at the earliest stages neuromuscular activity is possible without intervention of the central nervous system. Reflexes and reflex movements of all kinds are examined, including those studied by Magnus and de Kleijn; the special senses, too, are not omitted. The electrical excitability of the fœtal musculature receives attention. Prof. Minkowski divides fœtal life somewhat schematically into “phases” described as embryonic or neuromuscular, early fœtal or spinal, middle fœtal or tegmentospinal, and late fœtal or pallido-rubrocerebello-tegmentospinal, respectively; his intention is to indicate, along the lines followed by Magnus, that at such and such an antenatal stage the fœtus is a “neuromuscular animal,” a “spinal animal,” and so forth. While this is doubtless correct enough in a physiological sense the discrimination is apt to lead to a rather artificial conception of neural activity. The monograph is peculiarly interesting and worth perusing by all those whose concern is with the nervous system.

Dr. Böhme's contribution is on clinical lines and deals comprehensively with reflexes in health and disease. In addition to those, both superficial and deep, with which the clinician has long been practically familiar, due attention is paid to the relatively novel reflexes and automatisms which in recent years have been elucidated by a number of workers, and which exhibit the activities of mechanisms at spinal and mesencephalic levels. The application of the researches of Magnus and de Kleijn to human pathological cases here receives full discussion and illustration. Altogether a very useful contribution to “reflexology.”

Rheumatic Diseases.

Being the Proceedings of a Conference on Rheumatic Diseases held at Bath on May 10th and 11th, 1928. *Published by the Hot Mineral Baths Committee of the Bath City Council.* Pp. 292. 5s.

THE proceedings at the important Conference on Rheumatic Diseases which was held at Bath under the presidency of Sir George Newman in May last were reported in these columns, several of the papers being published in full at the time or later. These proceedings have now been issued verbatim by the Hot Mineral Baths Committee of the Corporation of the City of Bath, and the volume forms a useful indication of the present state of our knowledge in regard to the incidence, causation, and treatment of many very common and obstinate pathological conditions. For convenience of reference the papers have been grouped under the headings of Social and General Aspects, Causation, and Treatment; a good index makes the record readily available for inquiry. On many important matters the papers show a diversity of opinion and consequently the need for further investigation, but along general lines the therapeutics represent the most recent work, and the book will be welcomed by medical practitioners as a help towards the elucidation of puzzling problems and a guide for routine treatment.

Botany.

A Practical Botany for Matriculation. By MARGARET A. SHUTTLEWORTH, Biology Mistress, Sydenham County Secondary School. London: University of London Press, Ltd. 1928. Pp. 272. *5s.*

Miss Shuttleworth is already known as author of “The Wonders of the Human Body.” Her aim has now been to supply a book, the subject matter of which will cover the matriculation syllabus in botany. It represents the minimum to be attempted in a two-years course and does not presuppose any previous course in nature study. In the experimental sections only the simplest apparatus has been described, pupils being encouraged to devise other methods of doing their practical work. The book is more than an examination manual, for it is interestingly written and excellently produced and illustrated. The author regards the relation between flowers and insects as the best basis for the study of the variety of flower forms, and the attention paid to pollination makes the manual of special interest.

HISTOLOGICAL TECHNIQUE.

A Guide for Use in a Laboratory Course in Histology. By B. F. KINGSBURY, Ph.D., M.D., and O. A. JOHANNSEN, Ph.D., Cornell University, Ithaca, N.Y. London: Chapman and Hall, Ltd.; New York: John Wiley and Sons, Inc. 1927. Pp. 142. 11*s*.

THIS book is designed as an introduction to laboratory methods and should prove of benefit to those who aspire to become laboratory assistants as well as to medical students. The authors, from their own experience, have made a conservative, and in many cases happy selection of the most applicable lines of procedure in histological investigations. Thus the inquirer is not faced with the problem of choosing from a bewildering number of alternative methods. Several notes on the difficulties commonly encountered in laboratory technique are given and a tabulated list of the causes of defects and difficulties in sectioning paraffin blocks should be of help to the beginner. Certain parts of the book may be criticised on the grounds that they are too sketchy to be of value, notably the section on the microscope and its accessories, which might well have been omitted. Figures depicting microscopes and accessories unaccompanied by descriptions are of little use.

HÆMATOLOGY OF CHILDHOOD.

Die Klinische Hämatologie des Kindesalters. By HEINRICH BAAR, Assistant at St. Anne's Hospital, Vienna; and EUGEN STRANSKY, General Assistant at the Imperial Institute for the Care of Mothers and Infants, Vienna. Leipzig and Vienna: Franz Deuticke. 1928. Pp. 481. 48*s*.

THIS work forms a useful pendant to the exhaustive monograph of A. Schittenhelm on blood diseases in general; pædiatricians and hæmatologists alike will find a great deal to interest them in these lucid pages. The hæmatology of childhood has quite legitimately been treated as a subject apart. It is regrettable that no two successive authors in this field can quite harmonise their nomenclature, but a liberal choice of synonyms is offered. An attractive feature is the full recognition of English-speaking authors in the excellent bibliography. The main sections of this work are on normal blood in childhood, the anæmias of childhood, "acute system-reactions," such as leukæmia, and the hæmorrhagic diatheses. A particularly valuable account of blood changes in infections of various types is included, and also clear discussions on the influence of faulty diet on the blood picture, and on the "anæmia pseudoleucæmica infantum" and Banti's disease.

The book is likely to become a standard work of reference. In subsequent editions the illustrations might well be more ample, and the inferior photomicrographs omitted.

SURGICAL ANATOMY.

By GRANT MASSIE, M.B., M.S., F.R.C.S., Senior Demonstrator of Anatomy and Surgical Tutor, Guy's Hospital Medical School. London: J. and A. Churchill. 1928. Pp. 413. 15*s*.

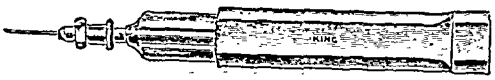
IT is difficult to break new ground in a subject like surgical anatomy; difficult, too, to keep the size of a volume within bounds and yet to include all that the ordinary student should know. There is nothing very original about this book, but the author has achieved the more important parts of his task with some success. He has given us a book easy to read and not too long, and yet sufficiently full for the needs of the student up for his finals. He states in his preface that his object has been to present anatomical facts attractively, and this also he has done. The illustrations are simple, clear, and informative, and the book should be popular.

New Inventions.

INJECTION TREATMENT OF VARICOSE VEINS.

(1) A NEW SYRINGE FOR INJECTING SCLEROSING SOLUTIONS INTO VARICOSE VEINS.

As is well known, it is essential for a successful injection that the sclerosing solution should come in intimate contact with the inner coat of the varicose vein in order to injure the endothelium; this injury will be greater the more concentrated the injected solution. On the other hand, it is necessary to make sure that the lumen of the vein has been entered, and this is done by aspirating some blood; the blood thus drawn into the syringe is apt to reduce the concentration of the sclerosing solution. It is therefore essential to aspirate as little blood as possible, and a syringe which allows the smallest quantity of blood to be clearly detected is indicated. I have used such a syringe for the last six months with most gratifying results. The essential part of it is the long fine nozzle made of polished glass, magnifying the extremely fine lumen. An infinitely small amount of blood is readily observed, which could not cause any dilution of the sclerosing liquid; a fine short bevelled needle is used with the syringe.

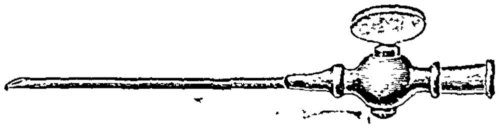


Messrs. Charles King, 34, Devonshire-street, London, are the manufacturers.

Harley-street, W. A. A. MILLER.

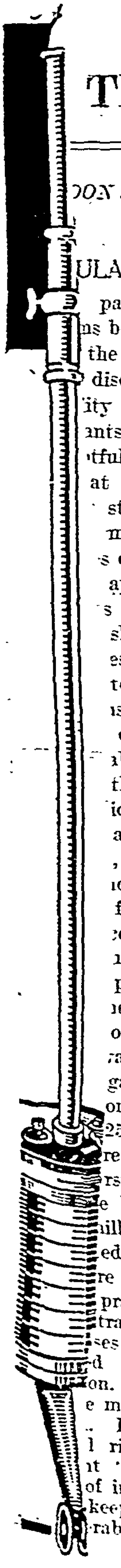
(2) NEEDLE FOR THE INJECTION TREATMENT OF VARICOSE VEINS.

THE needle here illustrated allows the syringe to be detached without causing undesirable effects while the patient is changing from the standing to the supine position, the prevention of loss of blood and of air entering the vein. Through the body of the needle head there is a hole into which a loosely fitting stop-cock is fitted. The stop-cock is "open" when the cross-bar is in line with the long axis of the needle. The stop-cock is fitted with a No. 17 needle, one inch in length. In use, the needle, attached to the syringe, is inserted into the vein while the patient is standing. The syringe is then detached allowing blood to flow from the needle and then the tap is closed by a quarter turn of the cross-bar. The patient then lies down and the needle will remain undisturbed in the vein. The limb is somewhat elevated and the nozzle of the syringe lightly approximated to the head of the needle, the cavity of which is gently filled with the fluid to be injected, so as to expel the air from it; the syringe is then firmly attached, the tap opened, and the injection made.



The needle is manufactured by Messrs. Allen and Hanburys, Ltd., Wigmore-street, London.

H. ARTHUR MURRAY, M.B., Ch.B. Edin.,
M.O., Colonial Medical Service (Basutoland).



THE LANCET.

ON: SATURDAY, SEPTEMBER 1, 1928.

ULATION AGAINST ENTERIC FEVERS.

paratyphoid outbreaks have put many ns before practitioners in the affected districts. the more important of these are the recognition disease in those who are unwell, and the ity of preventing infection of the healthy ants. Certain diagnosis of the enteric fevers tful cases owes more to the laboratory than at of any other group of diseases, since at stages of the disease either agglutination microscopic examination of blood, urine, s can be relied on to reveal infection. It is appropriate that the first of our new series s on the Clinical Interpretation of Aids to should deal with the topical subject of agglu-ests in enteric fevers, and we draw special to the detailed advice offered by Dr. A. B. s to the best methods of collection and of specimens of blood. The diagnosis ablished, the house-mates of the patient than likely to demand advice as to means ion since they have realised how extremely able an attack of paratyphoid fever may , therefore, worth while to consider the d nature of the vaccine which may be for protective purposes.

cess of anti-typhoid-paratyphoid (T.A.B.) ring the late war is familiar to everyone, preparation has been accepted as a con-eans of safeguarding persons likely to be o the enteric group of diseases. The army as made up to a strength of 1000 million ganisms per cubic centimetre—comprising on typhoid bacilli. 250 million paratyphoid 250 million paratyphoid B. Half a cubic re (or 500 million organisms in all) was given rst dose, after which 10 days were allowed e before giving the second dose of 1 c.cm. illion mixed organisms). These quantities edly produced a high degree of immunity, re is certainly no reason for exceeding them practice, as is sometimes recommended. On trary, it should be remembered that these ses of 500 and 1000 mixed organisms were d for healthy men in excellent physical on. They are probably too great for the e male civilian and undoubtedly excessive for .

In prophylaxis by vaccines the ideal is a l rise of immunity unaccompanied by un-t "reactions." Military life makes a long of injections inconvenient, because this would keeping the troops under observation for a rable time; the number of doses is, therefore, reduced to two. Similarly, there may be reasons in civil life why the resistance should be raised immediately rather than at leisure—e.g., the presence of an epidemic—but it is wrong to suppose that two large doses producing two strong reactions at a week or ten days' interval is the only means of securing immunity. When there is plenty of time before exposure to infection there is no reason why a feverish reaction should not be avoided altogether by starting with quite small doses—even as little as 10 millions at first—and gradually building up the patient's powers of resistance. The immunity thus induced would probably be stronger than that obtained from two large injections. No vaccines are calculated to save a person who incurs successive infection by large quantities of virulent organisms; to ask this is to ask too much. If enormous doses of enteric bacilli are taken, as sometimes happens, for example, among mental patients of unclean habits, even recent immunisation might not actually stave off the disease, though it would probably prevent its being fatal. The usual aim of prophylaxis is to arm us against small accidental contaminations of food, and it need be effective no longer than there is danger of these occurrences. Immunity is a purely relative term, but, judging by agglutination tests, that conferred by paratyphoid A vaccine in ordinary dosage tends to disappear after about a year; typhoid immunity may possibly last three years, whilst paratyphoid B occupies an intermediate position. In civil life relatively small amounts of vaccine—e.g., three doses of 100 millions, 200 millions, and 500 millions respectively might be tried with advantage. Probably these are somewhere near the minimal quantities for securing rapid immunity to moderate infection in a male adult. If immediate protection by a single dose is wanted 500 million T.A.B. organisms should prove sufficient for practical purposes, and half this amount can give a considerable reaction. Inoculation is believed to be followed by a "negative phase" in which the subject's resistance is somewhat lowered, and this might be regarded as endangering individuals who are given typhoid vaccine whilst exposed to infection. It is hard to say when this phase begins and ends, but its significance has probably been much exaggerated. It is said to come on shortly after the organisms have been administered and to cease as the febrile symptoms abate. The negative phase affords no good reason for abstaining from inoculation. Nor are there many other reasons provided that the dosage chosen is not too large. In estimating the quantities to be given to children a calculation may be made on the basis of body-weight, though this does not hold good for very small children; when in doubt it is better to give less rather than more than the calculated amount. Apart from this it is enough to say that alcoholics react rather strongly; that renal disease requires especial caution; and that care and judgment are naturally needed where patients are enfeebled by disease or any other cause.

At the beginning of the late war it was found that soldiers inoculated with pure typhoid vaccine readily contracted the paratyphoid fevers. This shows that the killed typhoid organism confers a specific immunity, being powerless to protect the patient against others of the enteric tribe; so the typhoid element in T.A.B. does not appreciably reinforce the action of the A and B elements. As paratyphoid A is almost unknown in this country, and typhoid is not a serious risk in most localities, it would be sufficient in face of a paratyphoid B outbreak to give a pure *paratyphosus* B vaccine. The total number of organisms given can thus be greatly reduced and the reaction—sometimes far from negligible—should also be diminished, though not perhaps in arithmetical proportion. To give the full anti-typhoid-paratyphoid vaccine for fear of a paratyphoid epidemic is like insuring against accidents by all means of transport when about to travel by aeroplane. Large doses of T.A.B., as now given with some freedom, are not likely to make inoculation popular, and it seems worth while to point out that they are seldom necessary.

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THE LEGAL LIABILITY OF HOSPITALS.

If a patient has some grave cause of complaint over the treatment he has received in hospital, it must surprise him to find how difficult it is to make the hospital liable in law for the actions of its expert staff. He may never have heard of the legal maxim *respondeat superior*, but he will know of frequent cases where an employer has been made to answer in damages for an employee's wrongful acts towards third parties. He will probably think of hospital and doctor as master and servant, for he will have an idea that the hospital exercises control over its expert staff by paying their salaries and by wielding the power of appointment and dismissal. But he will be wrong. These may be elements of the relationship between master and servant but—as Captain J. E. Stone makes clear in the careful analysis of the legal position which is concluded in our columns this week—these elements are not enough. The physician or surgeon on the staff of a hospital is nobody's servant. The hospital does not interfere with the prescriptions of the one or the operations of the other. The hospital's duty is to select a competent staff; it does not insure that the experts so selected will use that degree of care and skill which persons competent in that sphere may be expected to use. This limitation upon the doctrine of *respondeat superior* is by no means confined to the medical profession, but it happens to have been affirmed in three cases in which medical treatment was in question.

In the first of these (Hall *v.* Lees, 1904) a plaintiff complained that she had been injured by the negligence of a nurse provided by the defendants who were an association existing to supply duly qualified nurses. It was held that the association only undertook to supply a competent nurse for the patient, not to nurse the patient; the nurses had to follow the directions of the patient's doctor and the association was not responsible if a nurse failed to exercise due care and skill. Two years later, in Evans *v.* Liverpool Corporation, a jury found that the plaintiff's son had been discharged too soon from an infectious diseases hospital provided by the defendant corporation. He was sent home before he was completely recovered from scarlet fever, and consequently his brother and sisters were infected. Mr. Justice Walton held the defendants not liable. "They do not undertake the duties of medical men or to give medical advice, but they do undertake that the patients in their hospitals shall have competent medical advice and assistance." The doctor in charge was admittedly competent and so no blame attached to the corporation for employing him. Finally, in Hillyer *v.* St. Bartholomew's Hospital the Court of Appeal put the matter beyond doubt in 1909. A patient somehow received burns while under an anæsthetic on the operating table; he sued the hospital but his claim failed. Lord Justice Farwell said it was impossible to contend that the surgeon or the acting assistant surgeon, or the house surgeon, or the anæsthetist were servants of the hospital in the proper sense of the word. They were all professional men employed by the hospital to exercise their profession to the best of their abilities according to their own discretion; in exercising it they were in no way under the orders of the hospital or bound to obey its directions. A similar principle applied to the nurses. "The nurses and carriers assisting at an operation cease for the time being to be the servants of the defendants (the hospital), inasmuch as they take their orders during that period from the operating surgeon alone."

As Captain Stone is careful to point out, Lord Justice Kennedy, while concurring in the court's decision, added a qualification. "It may well be," he remarked, "that the hospital authority is legally responsible to the patients for the due performance by their servants within the hospital of their purely ministerial or administrative duties, such as, for example, attendances of nurses in the wards, summoning of medical aid in emergency, the supply of proper food, and the like." Hospitals, therefore, it appears, must distinguish between the matters of professional skill in which the hospital board will not interfere with physician, surgeon, or nurse, and the "purely ministerial or administrative duties" which the board is responsible for regulating. Presumably it would be for the jury to apply the distinction to the facts of a particular case. But a jury could hardly decide without giving due weight to the evidence of the medical profession on what would be largely a matter of professional practice. The same remark applies to those occasions where there is a question of the relative responsibility of nurse and medical practitioner as in a recent case where a patient was scalded by a hot-water bottle. If the profession can achieve unanimity in its evidence regarding the particular functions delegated by physicians or surgeons to nurses, the court and the jury are not likely to take a different view.

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DENGUE IN ATHENS.

An epidemic described as dengue fever has attacked the inhabitants of Athens and the Piræus during the last few days. The number of cases is reported to be between 160,000 and 200,000. All business is paralysed and many shops, offices, and factories have had to close down owing to the illness of their staffs. The leading bank, with a normal staff of 180, is now carrying on with only 20, while Government departments are quite disorganised. The epidemic is now spreading to the provinces, whither Athenians have fled to avoid contagion.

Dengue fever is best known as an endemic infection in the coastal regions of India, China, the East Indies, and throughout the Pacific islands. Many widespread epidemics have been recorded since Manson first described the virulent outbreak in Amoy in 1872, which completely paralysed the small European population of the town and attacked 95 per cent. of the Chinese population. The exact method of conveyance of the disease was at that time unsuspected; but Manson recorded with characteristic fidelity the sudden onset, the excruciating bone pains which have bestowed the synonym of "dandy" or "breakbone fever" on the affection. Other peculiar features—the double crisis of fever, the purpuric rash, and the post-febrile bradycardia—were also noticed in the Amoy cases. To show the sudden onset of symptoms it is recorded that victims attacked while shaving would drop a razor to the ground from a helpless hand. Since that period dengue has occurred at intervals of years in epidemic waves, mainly in the early autumn months. In Europe it has appeared in Southern Spain, Gibraltar, Malta, Turkey, and, notably in 1881, in the Ægean Islands. In Asia Minor serious epidemics have occurred in Smyrna, Cyprus, Beirut, Jaffa, and Jerusalem. While normally a coastal disease, in its pandemic form dengue spreads a considerable distance beyond its usual confines and may even, in Syria, ascend mountains to a height of 5000 feet. That the disease is spread solely by the agency of mosquitoes has been recognised since the original observations of H. GRAHAM in Beirut in 1903. At that time he suspected that the carrier was the common brown mosquito *Culex fatigans*, though since then the carefully conducted experiments of CLELAND, BRADLEY, and MCDONALD, in Australia, have incriminated the common "tiger mosquito," *Aëdes argenteus* (formerly known as *Stegomyia fasciata*) as the sole vector. The exact nature of the dengue virus is unknown, but the researches of CLELAND and his fellow workers have shown conclusively that the virus is attached or agglutinated to the red blood corpuscles and can pass through the pores of a Pasteur-Chamberland filter. J. F. SILER has demonstrated that the blood in dengue is infective to the mosquito for 18 hours before the onset to the end of the third day of the illness. The mosquito, after imbibing dengue blood, does not become infective for 11 to 14 days, but thereafter remains so for the rest of its life.

For the development of an epidemic the vector must be present in large numbers, and this implies defective sanitation and abundant opportunities, in the supply of stored water in close proximity to the houses, for the mosquito to breed; in short, the conditions which favour the spread of dengue are similar to those conducive to yellow fever. At the present moment conditions in Athens must be unusually favourable to the propagation of *Aëdes argenteus*. As regards potential disability during an attack dengue is serious enough, but as a rule it leaves no permanent serious sequelæ in its wake, and the mortality-rate is very low. Perhaps it is for this reason that no specific pathological lesions, gross or microscopic, have been discovered. Unfortunately the present epidemic at Athens appears to be exceptional in having a high mortality-rate, the attacks being often fatal. Probably, however, the infection is killing only those who are the subjects of grave heart or kidney disorders, where it acts as the immediate cause of death. If dengue is the sole cause it must be of an unprecedented virulence. Another possibility is that the epidemic may be due to some other infection. If it is dengue there is no prospect of abatement until the advent of the cool weather, which cannot be expected for another two months.

POST-VACCINAL ENCEPHALITIS.—The Small-pox and Vaccination Committee of the Health Committee of the League of Nations met at Geneva on August 22nd under the presidency of Dr. R. Jorge, of Portugal, to consider this among other questions. A report has been drawn up in which the rarity of these cases is emphasised, in comparison with the total number of vaccinations in any country. The committee points out that children between 3 and 13 years of age are particularly susceptible, whereas infants and adults are hardly ever affected; this age incidence suggests the inadvisability of postponing primary vaccination, which is the most powerful weapon available against small-pox, until after infancy. The appearance of encephalitis is not held to be associated with any particular strains of lymph or with accidents ir [illegible] mittee conclude, on the evidence [illegible] accinal encephalitis is distinct from [illegible]

Annotations.

"Ne quid nimis."

THE COPENHAGEN CONGRESS.

THE First International Congress of Oto-Rhino-Laryngology, which was held at Copenhagen at the opening of last month under the presidency of Prof. E. Schmiegelow, was fully attended. The meetings were held in the Christiansborg, the Danish Houses of Parliament, and the opening ceremony was honoured by the presence of the King of Denmark. The amount of material was so great that the Danes generously forwent the reading of their papers. There were four main subjects for discussion: (1) Septicæmia as a result of pharyngeal infection, opened by Prof. W. Uffenorde (Marburg) and G. Ferreri (Rome), the opening with excellent lantern slides showing invasion of vessels in the neck by organisms. (2) The conservative radical operation, by Prof. H. B. Neumann (Vienna), well illustrated by slides of microscopical sections to show bony changes going on in apparently healed radical operations. Mr. H. Barnett (Bath) followed, condemning the radical operation. Considerable discussion took place, but nothing really new emerged. (3) The influence of anatomical structure of the middle ear on the course of suppuration therein by Profs. F. J. Moure and G. Portmann (Bordeaux) and by Prof. K. Wittmaack (Hamburg). This is a subject on which otologists in this country have long held definite opinions, led by Mr. A. H. Cheatle. (4) Surgical diathermy for cancer of the pharynx, larynx, and œsophagus, opened by Dr. Dan McKenzie, followed by Mr. Norman Patterson (London); a strong case was made out for removal of growths by the diathermy knife instead of the cold knife. In the subsequent discussion papers were given by French and Spanish authors. The shorter papers read at the Congress dealt with practically every branch of the specialty. To mention one or two that were outstanding: Dr. A. Pohlman (St. Louis, U.S.A.) spoke on "minimal audition"; experiments on this subject had been made with an audiometer and many interesting observations emerged, notably that lengthened bone conduction is apparently not real. This property was, however, vigorously sponsored by clinical observers of the German school. It seems that the audiometer has not been given enough attention in this country. Dr. Wells Eagleton's (Newark, U.S.A.) study of sixth nerve involvement in connexion with the early diagnosis of meningitis called forth some interesting discussion. Dr. E. Huizinga and Dr. C. E. Benjamins (Groningen) brought forward some interesting work on ablation of parts of the internal ear in pigeons; they found that destruction of the lower part, including the saccule, produces no demonstrable effect on the movements of the birds; while ablation of the superior part containing the utricle and three ampullæ has the same result as complete destruction of the labyrinth. Mr. V. E. Negus (London) put forward in his paper the ingenious suggestion that the function of the cricopharyngeus sphincter was to prevent air passing into the œsophagus during inspiration. In addition to the scientific work there was much entertainment offered by the President, the Committee, and the civic authorities, and Dr. N. Rh. Blegvad deserves a special word of mention for his all-embracing labour as general secretary.

PINEAPPLE JUICE.

CHILDREN have always preferred the raw pineapple, when obtainable and however crude, to the uniform and refined product in sealed tins; and their choice is wise, for, as the *Journal* of the American Association has reminded us again, fresh pineapple juice contains an active proteolytic enzyme known as bromelin, which is destroyed when the juice is heated or the fruit is canned. No doubt both clauses are true when canning implies heat; but our own chemist pointed out a quarter of a century ago that, while the peculiar digestive agent of pineapple is destroyed by cooking, there is no reason why tinned fruit should not retain its digestive power, provided that the pineapple is not preserved by heat. Bromelin, as we then showed, would digest as much as 1000 times its weight of protein, whether of meat or eggs, within a few hours, and there is an abundant supply of the enzyme in the pineapple for the average sized pine will yield nearly two pints of juice. Unlike pepsin, the digestive principle of the pine appears to operate equally well in an acid, neutral or alkaline medium. There would therefore be more justification for eating pineapple and beefsteak together than there is in eating red currant jelly with roast mutton, although we may reasonably assume in the latter case that it was because an enzyme accompanied the pleasant taste that this culinary constellation arose and retained its sway. Bromelin must not, of course, be confused with bromalin, a combination of hexamine and ethyl bromide which has had some vogue in neurasthenia and epilepsy. It is curious that Remington's Practice of Pharmacy, which is such a complete collection of drug lore in America, contains no mention of this pineapple enzyme, although it is mentioned in Tibbles's Foods and is well recognised so far afield as in Mayerhofer and Pirquet's Lexikon, and in Nadkarni's Indian Materia Medica.

THE LATE INFECTIVITY OF SCARLET FEVER.

It used to be thought that after about six weeks, and the completion of desquamation, the scarlet fever patient was free from infection. Later it came to be noted that after the discharge of scarlet fever patients from hospital a fresh infection occasionally arose in the home. For example, in 1894 Dr. A. K. Chalmers reported that among 2593 patients discharged from the infectious hospitals in Glasgow fresh cases appeared in 70 of the houses to which they were sent. An investigation set up by the Metropolitan Asylums Board culminated in a lengthy and valuable report[1] by the late Dr. A. G. R. Cameron in 1904. In this report he emphasised—what was already known to many—that it was the convalescent with unhealthy mucous membranes who was more likely to be infectious and that there was no evidence of infection arising from late desquamation. Of late years there has arisen a tendency to curtail the detention period of this disease. In his report[2] to the Ministry of Health Dr. Allan C. Parsons gives information concerning the minimum period of detention of uncomplicated cases in 46 hospitals. The authorities of 15 of these required 42 days detention as the minimum, one 40 days, three 35 to 42 days, six 35 days, one 30 days, eighteen 28 days, and two 21 days. Thus it will be seen that 25 observers do not differ much from the old dictum. There is little doubt that a number of sufferers from scarlet fever are free from infection at the end of four weeks and probably earlier, and if diphtheria can be taken as an analogy it is certainly so, but the difficulty is in picking out those who are free from infection from those who are not. It is admittedly unsafe to consider free from infection those who suffer from a pathological condition of the throat or of the nose, or those who may have an unhealthy condition of an ear. But it is not always easy to decide that the tonsils are quite normal, and it may be quite impossible to discover a tiny nidus of infection in the small nasal passages of a young child. It may be said that this is also so at a later stage of the disease, but it is to be remembered that the natural tendency of the human being is to rid himself of infection and therefore the risk in early discharge is greater. In detecting infection in similar cases of diphtheria careful bacteriological examination is of some help, but this can hardly be said of scarlet fever, for it is difficult to differentiate the streptococcus of this disease from other hæmolytic streptococci. On the whole, therefore, and admitting our want of precise knowledge, it may be considered wise to regard scarlet fever patients who show no pathological condition of the throat, nose, or ear as possibly infectious for a period of about five or six weeks after the onset of the disease. There is ample evidence that the late desquamation is not in itself infectious, and there is no definite evidence that the earlier desquamation is capable of causing infection to others. On the other hand, patients suffering from pathological conditions of the nose or throat should not be considered free from infection until recovery from them has taken place. A discharge from the ear does not appear to be so fruitful of infection, and consequently some observers consider it comparatively safe to discharge such cases at the end of three months. It is easy, even for the experienced, to fail to observe some small unhealthy area of the mucous membrane, and it should always be borne in mind before declaring a patient to be free from infection that a most careful examination should be made.

ALUM IN BAKING POWDERS.

Food prepared by modern methods frequently contains small quantities of constituents, the presence of which is not suspected either by the consumer or his physician, and which by their long-continued action may set up symptoms which are distressing to the one and puzzling to the other. Five workers at the Institute of Physiology of the University of Strasbourg[1] have investigated the effects of "mineral leavens" or baking powders containing alum; a matter which is not new, but which, having regard to the very different views held in Europe and America, fully justified reinvestigation more especially as the Strasbourg workers, as they point out, have considered the physiology rather than the gross toxicology of the question. They say "we would like to show by a precise example to what social dangers we are exposed through the daily use of products which have no justification from the physiological point of view, but only mean a slight economy of time to cooks and housekeepers." This way of looking at things may well be commended to those who would suffer the addition of boric acid to food.

The American tolerance of alum in baking powders, which the health authorities of most European countries virtually forbid—even in blockaded Germany when potassium bitartrate could not be procured, "hygienists" we are told, "severely opposed themselves to the production or sale of mineral leavens containing alum, even as an *ersatz*"—is due to the belief that if the powder is a scientifically calculated mixture of acid calcium phosphate, alum, and bicarbonate of soda, all that remains in the bread when the reaction is finished will be sodium sulphate, acid sodium phosphate, calcium carbonate, and aluminium phosphate. The insolubility of the last substance is apparently assumed. As a matter of fact, although the Strasbourg workers do not refer to it, W. D. Bigelow and C. C. Hamilton in 1894[2] concluded that the influence of alum in flour on digestion was overestimated, but that, notwithstanding statements as to its insolubility, aluminium phosphate had a retarding effect on gastric and pancreatic digestion in vitro, while two years earlier O. Hehner had shown by experiments on himself and two assistants that baking powder containing alum when taken alone caused diarrhœa and painful indigestion. Comparative experiments on mice have shown Schaeffer that bread containing aluminium phosphate gives rise to a paracellular necrosis of the superficial epithelium of the stomach and of the tops of certain intestinal villi, these lesions greatly resembling erosions found in human pathology. When dogs are fed with similar aluminous bread lesions are not formed in either stomach or small intestine, but in the large intestine, and especially in the descending colon and the sigmoid flexure. Further, there seems to be a specific action of the aluminium ion on the ovary, as the productivity of female mice is much diminished if they are fed on the aluminious diet, and the offspring succumb more easily to infantile disease. Anatomo-pathological examination confirms these experimental results in a striking manner. While in the case of male mice having absorbed aluminium the testicles remain normal and the spermatogenesis active, the female mice show characteristic lesions of the ovaries.

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[1] Report on Return Cases of Scarlet Fever and Diphtheria between July, 1901, and July, 1902.

[2] Some Administrative Aspects of Scarlet Fever, 1927.

[1] The Dangers of Certain Mineral Baking Powders Based on Alum, when Used for Human Nutrition. By Georges Schaeffer, G. Fontes, E. Le Breton, Ch. Oberling, and L Thivolle. Journal of Hygiene, August, 1928.

[2] Jour. Amer. Chem. Soc., xvi., 587–597.

The Strasbourg chemists' concluding paragraph is well worth reproducing: "We hope," they write, "that this summary of our researches will be sufficient to make clear the nature of the danger spoken of at the beginning of this article. We see that certain bodies, not poisons in themselves in the usual sense of the word, can provoke physiological disorders and organic lesions, the ætiology of which remains generally unnoticed, when they are absorbed daily for months and years. Such products are most certainly responsible for many illnesses, the frequence of which augments with the alimentary conditions imposed on us by modern civilisation in a manner inexplicable beforehand. Our object will have been attained if we succeed in attracting the attention of physicians and hygienists to certain problems, the study of which is perhaps not very attractive, but the solution of which is of considerable practical interest."

THE MEDICAL RELATIONS OF LAFONTAINE.

THE author of the celebrated "Fables" was by no means an admirer of the medical practice of his time, yet he associated on friendly terms with quite a number of physicians, some of whom were distinguished in their day. On the mother's side he was descended from two royal physicians, and he had two maternal uncles who practised medicine. Yet, as Dr. George Morin writes,[1] he does not seem to have inherited any therapeutic instincts from his medical forbears. His mother was Françoise Pidoux, whose family was well-to-do and important in Poitou for many years. The great-grandfather of the poet was François Pidoux, who received his diploma of Doctor at Montpellier, and settled in Poitiers instead of his native town of Châtellerault, became the doyen of the medical faculty of Poitiers, and waged war against charlatans of all sorts, of which Poitou was always a happy hunting-ground. He also insisted on the application of the edict of Blois which prohibited the sale of medicines by druggists, except on medical prescription. This was in 1541—so long has been the struggle against counter prescribing! François Pidoux was called in to treat important personages and at length was appointed first physician to King Henry II. He died in 1600, leaving the family of Pidoux among the most influential in all Aquitaine. His second son, John, following in his footsteps, studied under his father in Poitiers and became personal physician to the Duke of Anjou, afterwards Henry III. of France, whom he accompanied on an expedition to Poland, on which occasion he proved useful to the father of Cardinal Richelieu and secured his favour. On the accession of Henry IV. he became also his physician. Jean Pidoux was the author of the first book in French on hydrotherapy and balneology. He published, in 1587, a treatise on "La vertu et usage des fontaines de Pougues en Nivernais et discours qui peut servir aux fontaines de Spa et autres de pareil goût." Not content with his doctorate of Poitiers he obtained 20 years later the similar degree at Paris. His inaugural thesis was entitled De Febrium Curatione. He lived in influential and literary society in Paris and was employed in various important political and social affairs connected with the Court. His ambition to shine as an author of verse was not gratified, for his efforts, says Dr. Morin, are not worthy of the grandfather of the author of the fables. If Lafontaine inherited from the Pidoux no aptitude for the practice of physic, he seems at least to have received through his mother their love of good cheer and of good company and their capacity for enjoyment. He describes in a letter to his wife a visit to one of the Pidoux of Châtelleráult, a kindred spirit who at the age of 80 was full of the joy of life. Dr. Morin concludes by deciding that Lafontaine was a regular Pidoux, a Pidoux full of life and spirit, imaginative, light-hearted, and frivolous.

A NEW ANTHELMINTIC.

THE search for a vermicide harmless to man continues. Dr. J. Chevalier[1] brings forward the claims of two pyrethrines obtained from *Chrysanthemum cinerariaefolium*, the insecticidal pyrethrum, and isolated by fractional distillation in vacuo. They are non-crystalline, insoluble in water, but easily dissolved in organic solvents, and can readily be rendered almost inert by saponification. It has been found impossible to kill warm-blooded animals by oral ingestion or by subcutaneous injection of these substances, though intravenous injection at the rate of 2 mg. per kg. of body-weight produces clonic convulsions, and 6 mg. is fatal. On the other hand, cold-blooded animals such as fish, leeches, earthworms, and frogs die in dilutions of from 1 in 1,000,000 to 1 in 3,000,000. Classing intestinal worms as akin to cold-blooded animals, Chevalier found experimentally that *Ascaris lumbricoides* of the pig and tænias of the dog became detached and convulsive, and presently died when placed in a "dilute" solution of the drug. Experiments in the treatment of animals are reported as successful, and excellent results are said to have followed its use in human beings infected by various worms and by giardia; the drug is also being tested on the hookworm in Egypt. Detailed reports of the dosage used and of the grounds on which these conclusions have been reached will be awaited with interest, seeing that the preliminary note is silent on these essential matters.

THE LATE SEQUELÆ OF EPIDEMIC ENCEPHALITIS.

THE serious prognosis of the later manifestations of epidemic encephalitis, to which we drew attention in a leading article on June 30th, is confirmed by the studies of Dr. Lloyd H. Ziegler, published in the *Journal of the American Medical Association* of July 21st. Working from the Mayo Clinic he has followed up 752 patients who had attended the clinic for epidemic encephalitis during the period 1918 to 1927. The mortality-rate for this group was low at 13·2 per cent., but on the other hand the complete recovery-rate was only 1·3 per cent.; of the total number of patients 15·7 per cent. were able to work regularly, and 25·7 per cent. were able to do light or part-time work. Unfortunately there is little doubt that the work figures for the same group of patients will diminish in time, owing to the fact that the condition usually progresses slowly, and many of the patients in the series only had their attack within the past four years. Half of them developed chronic sequelæ immediately after the acute attack; nearly 10 per cent. recovered entirely from their acute attack, only to develop chronic sequelæ 15 (average) months later, and in one case the latent period was actually seven years. Fully a quarter of the patients exhibited a residual stage practically indistinguishable from post-influenzal debility for 14 (average) months before sequelæ emerged, and no fewer than 15 per cent. of these patients are now Parkinsonians. The mental aspect does not appear to have received the same careful attention as the neurological in this investigation, only very obvious symptoms being recorded. There seems little doubt that when the encephalitic temperament is more generally recognised it will be appreciated that the chronic invalidism of the encephalitic is due as much to mental as to physical disabilities. The lowering of emotional values, the craving for sympathy and attention with exaggeration of physical deficiencies, and the childish outlook and lack of concentration of the average encephalitic are often more important factors in the economic question of ability for self-support than are the tremors, mild rigidity, ocular symptoms, and other neurological manifestations. The futility of our present methods of treatment of this disease is brought out by Dr. Ziegler's study. All the recognised methods were tried in this series of cases, and apart from the undoubted value of scopolamine as a palliative measure in Parkinsonism no therapy can be regarded as of any appreciable value. At the Mayo Clinic sodium cacodylate is regarded as a useful tonic, and supplemented by good general care and attention to obviously active foci of infection forms the usual method of treatment. Streptococcal vaccines, autogenous or prepared from patients with similar disorders, have been extensively used at this clinic, but the results obtained were no better than with other therapeutic measures. It appears that the most hopeful sign in the realm of this disabling disease is the steady diminution in the number of fresh cases which has occurred in each succeeding year since the severe epidemic of 1924.

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[1] L'hérédite médicale de Lafontaine, Paris Médical, July 21st, 1928.

[1] Bull. de l'Acad. de Méd., 1928, xcix., 446.

LOCAL MALARIA CONTROL IN BENGAL.

Birnagar or Ula, credited with being the place whence spread the disastrous malaria epidemic of 1856, is one of those half derelict towns so frequent in the upper Gangetic delta, with a population of 2300 in place of the 40,000 of 70 years ago before malaria, speaking without metaphor, laid it waste. Five years ago some inhabitants, stung by the position, formed a local public health society, whose keen honorary secretary has just issued one of his periodical reports.[1] Funds are supplied by considerable private subscriptions, by a substantial grant from the Bengal Government, and by a large gift of quinine from its director of public health. The antimalarial measures used have been the oiling of anopheline breeding-places and a wide administration of quinine. The difficulties encountered in this private enterprise have been those familiar when such campaigns have been attempted in India by Government officers. There has been some stubborn opposition to oiling, two and a half out of eight and a half miles of water edge in the small area actually covered having had to be left unprotected. These untreated tanks have bred larvæ profusely, and it is significant that while the municipal authority has contributed generously to the funds of the society, the municipal tank is not one of those which the society has been permitted to oil. Some of the observations made have a wide applicability. The washing of muddy water into tanks was followed by destruction of all larvæ, breeding recommencing immediately as it settled and cleared. While, apart from this, mosquitoes bred continuously they did not torment human beings during dry weather, but as soon as rain fell entered houses and bit, while the malaria-rate rose after the usual interval. It is believed that in dry weather the insects remained inactive in the all-embracing jungle, and that this is also the explanation of the immediate but temporary influx of mosquitoes into houses when neighbouring jungle is felled. Such clearance has been begun with sale of wood and cultivation of land, but permission for further clearance is being withheld by owners. The future is not looked forward to with hope. It is felt that the determination of the mosquito species most implicated locally in transmitting malaria requires more expert knowledge than is available on the spot, but it is, after all, improbable that the ungrudging coöperation of the Bengal Malaria Research Laboratory, already afforded in identifying larvæ, will not be extended to the dissection of mosquitoes locally collected, a subject particularly appropriate. It is believed, too, that the local campaign should be merged in a wider one to be undertaken, the writer suggests, by the District Board. If certain indications in the report are read aright it is questionable whether anything will replace adequately an enthusiastic local patriotism.

CHEMISTS AND BENZOL.

We owe to research in America, originated in industry,[1] the disclosure that benzol possesses definite toxic properties. When its fumes are regularly inhaled in a strength of 100 parts per 1,000,000 of air the hæmopoietic organs are attacked, and anæmia follows with decrease of polymorphonuclear leucocytes. Industrially benzol is used as a valuable solvent, particularly of rubber. Fortunately less toxic solvents, such as toluol, xylol, or high flash naphtha, can be substituted, and it has never come into widespread use in English factories. Now a useful note[2] of warning is given to chemists working in laboratories, who are notoriously careless about exposing themselves to unnecessary risks. They are urged to confine the use of benzol to testing, and to abolish it as a cleansing agent for which it is far too often used in profusion. If for any reason continued exposure is unavoidable, the chemist should place himself under medical examination once every month or two. Chemists tend to disregard the fact that the human body is a delicate reagent always ready to react when exposed to unsatisfied compounds, of which benzol is one.

THE PHYSIOLOGY OF FASTING.

Many religions exhort believers to fast for the good of their souls, and most unqualified and some qualified schools of medical thought advocate occasional fasting for the good of the body. There is no doubt that some degree of reduction in the diet produces excellent results in a great many persons, but there is much uncertainty about the mechanism by which these results are produced. Prof. P. F. Richter holds the view that for lack of knowledge of the physiology of hunger a valuable therapeutic weapon is being neglected. In a recent address[3] to the Berlin Society for the Study of Internal Medicine he dealt exhaustively with hunger from the clinical point of view. Its syndrome is, he says, primarily a defence mechanism. Deprived of a part of its supplies, the organism promptly adapts itself for work on a restricted intake. It reduces its combustion rate and institutes economy in all its departments. By lessening the pangs of hunger it enables itself to endure the new conditions as long as possible. Fasting is, therefore, an effective means of lowering the metabolic rate at need. One of the most important fields for its use is diabetes, and research into the biochemistry of hunger would almost certainly elucidate many diabetic phenomena which are as yet unexplained. What evidence there is suggests that the effect of hunger on the nerves and musculature is rather to improve their condition than to do them any harm. It causes a slight fall in blood pressure, but a constant level is soon reached. A change from a meat to a vegetarian diet. according to O. Müller and M. Gänsslen, quoted by Richter, improved the state of the peripheral circulation; this is because meat proteins cause spasm of the arterioles and dilatation of the capillaries, a condition which is rectified when they are removed from the diet. For the victims of Graves's disease fasting is indicated. War-time researches showed that compulsory semi-starvation was beneficial to over-active thyroids, and it is probably this action on the thyroid which determines the drop in basal metabolism. Fasting seems to have no deleterious after-effects. Oxidation is apt to be somewhat unduly rapid when the fast is first broken, and the cells show such a large capacity for absorbing protein as seems to contradict all the known laws of nitrogen metabolism. According to Richter, fasting should benefit disorders of carbohydrate metabolism (although the pancreas may suffer in diabetic patients) and spastic disorders of the blood-vessels such as glomerulonephritis. In allergic conditions such as migraine, eclampsia, epilepsy, and asthma it acts by reducing the intake of foreign proteins. The leakage of protein into the blood stream through the intestinal mucosa is responsible for a multitude of ailments, and the alteration in the membranes is thought by some workers to be due to an interference by unwise dieting with the balance of flora in the bowel. A fast will often restore this balance. Fasting for high blood pressure is, in Prof. Richter's opinion, not indicated, since the pressure is not appreciably altered. Summing up, he likens its action to the stimulation of a foreign protein, but gives a warning that the estimation of the patient's tolerance is a difficult matter.

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[1] Malaria Control in Birnagar, 1927. By Krishnasckhar Bose.

[1] Greenburg, Leonard: Benzol Poisoning as an Industrial Hazard. Public Health Reports, Washington. July 2nd, 9th, and 23rd, 1926.

[2] Bloomfield, J. J.: Benzol Poisoning as a Possible Hazard in Chemical Laboratories. Public Health Report, Washington. July 20th, 1928.

[3] Deut. Med. Woch., 1928, i., 1067.

AMYLOID DISEASE.

THE cure of three out of 15 patients in whom the existence of amyloid disease was definitely proved is recorded by Prof. J. H. Waldenström in a beautifully illustrated monograph [1] on the formation and disappearance of this condition.

The author is unable to tell us anything new about the chemical structure of amyloid. He notes that it is a protein substance rich in tyrosin, and suggests that the toxic effects of prolonged suppuration prevent the formation of certain unknown proteolytic enzymes; in the absence of these the body becomes saturated with this protein substance which is deposited along the visceral blood-vessels. As a result of considerable clinical and pathological investigation he holds that if amyloid occurs at all it is invariably found in the liver, where it is evenly distributed. A further observation made is that a liver may be rich in perivascular amyloid deposit and yet show no enlargement, because of the tendency for the amyloid strands to crush the liver parenchyma. Prof. Waldenström believes that a mixed infection is necessary for the production of amyloid, but in spite of careful search he could not incriminate any particular combination of organisms. By protein saturation he produced amyloid in mice. He found that one mouse in four is amyloid-immune, and believes that there is a similar constant proportion of human subjects amyloid-immune. The production of amyloid seems to take about two years from the time of the establishment of the septic focus; and about the same period is required for its eradication. Prof. Waldenström's treatment for the causative surgical lesion is conservative; at his hospital the patients live in big sunny verandas, and are given abundance of butter and cream. The diagnostic methods adopted in suspected amyloid disease are drastic, but leave no doubt as to the nature of the condition. A trocar and cannula similar to a lumbar puncture needle, except that its calibre is 1¼ mm., is thrust into the liver and the trocar is withdrawn. The cannula is thrust forwards about 2 cm. and twisted slightly in its long axis. A rod of liver tissue is thus cut, withdrawn from the cannula by a powerful little suction syringe, and examined microscopically. In each of the three cured cases at least three liver punctures were made, and by sections of material so obtained Prof. Waldenström demonstrated successively over a period of about three years normal liver tissue, liver tissue stuffed with amyloid deposit and finally restored normal liver tissue. In THE LANCET of July 21st Dr. G. F. Walker recorded a case of amyloid disease of considerable duration which yielded to treatment, and we welcome this further evidence that a disease which was long held to be both common and fatal is now not only rare but also in certain conditions curable.

STRONTIUM FOR MIGRAINE.

GOOD results from a new method of treatment of migraine are reported by Dr. Max Serog, of Breslau, in a paper [1] which has just been published. Having found, in occasional instances, an improvement after intravenous injection of a preparation of strontium, he made a systematic trial of treatment with this metal and now reports the results in 20 cases. All the patients experienced great relief; many of them suffered previously from very frequent attacks, and, after a course of strontium, were free from headaches for many weeks; some are described as being "quite free" from attacks but, unfortunately, it is not stated how long such patients were kept under observation. The preparation used by Dr. Serog was "neostrontan," made by the firm of Tosse, Hamburg. Five cubic centimetres of a 10 per cent. solution of this strontium derivative were given intravenously, followed at intervals of two days by two injections of 5 c.cm. each of a 20 per cent. solution. The injections were well tolerated; the only unpleasant symptom was a feeling of heat or flushing of the face, and this could be greatly reduced if the injection was given very slowly and, when the flushing began, temporarily stopped until it had passed off. The best results were obtained with the younger patients. It is noteworthy that in several cases it was possible to cut short an attack of migraine by giving an injection of neostrontan—even when the attack was at its height. It seems that this treatment is capable of attaining successful results, especially in cases in which the attacks are very frequent, and it may be used either in combination with other methods or where other methods have failed. But the path of the physician is strewn with discarded remedies for migraine.

CURRENT VITAL STATISTICS.

ON another page we deal with some of the lessons which may be drawn from the text of the Registrar-General's Review of the year 1926. In the meantime the early appearance of Part I. (Medical Tables [2]) of the Review for 1927 has almost bridged the gap between the two years. The salient features of this review were embodied in a provisional statement,[3] which has, of course, not been substantially modified. The birth-rate of 16·6 for the year 1927 is the lowest rate recorded since the establishment of civil registration in this country, the lowest rates previously being those for 1918 (the last year of the war)—viz., 17·7 and for 1926—viz., 17·8 per 1000 population. The death-rate was 12·3 per 1000 population, slightly higher than for any year since 1922. The rise affects the two sexes almost equally, and was due to a severe epidemic of influenza in the March quarter. The death-rate in the June quarter was the lowest on record for the second quarter of the year, while the rates in the third and fourth quarters were below the average rate in the corresponding quarters of the last five years. The deaths of infants under 1 year of age were equal to 70 per 1000 births, being the same as for the previous year; thus the two years 1926 and 1927 have the lowest infant mortality-rate on record except only that for 1923—viz., 69. The mortality from the infectious diseases differed little from that for the previous year, except that the deaths from influenza numbered 22,263 and were equal to a rate sequelæ emerged, and no fewer than 15 per cent. of these patients are now Parkinsonians. The mental aspect does not appear to have received the same careful attention as the neurological in this investigation, only very obvious symptoms being recorded. There seems little doubt that when the encephalitic temperament is more generally recognised it will be appreciated that the chronic invalidism of the encephalitic is due as much to mental as to physical disabilities. The lowering of emotional values, the craving for sympathy and attention with exaggeration of physical deficiencies, and the childish outlook and lack of concentration of the average encephalitic are often more important factors in the economic question of ability for self-support than are the tremors, mild rigidity, ocular symptoms, and other neurological manifestations. The futility of our present methods of treatment of this disease is brought out by Dr. Ziegler's study. All the recognised methods were tried in this series of cases, and apart from the undoubted value of scopolamine as a palliative measure in Parkinsonism no therapy can be regarded as of any appreciable value. At the Mayo Clinic sodium cacodylate is regarded as a useful tonic, and supplemented by good general care and attention to obviously active foci of infection forms the usual method of treatment. Streptococcal vaccines, autogenous or prepared from patients with similar disorders, have been extensively used at this clinic, but the results obtained were no better than with other therapeutic measures. It appears that the most hopeful sign in the realm of this disabling disease is the steady diminution in the number of fresh cases which has occurred in each succeeding year since the severe epidemic of 1924.

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[1] Act. Chi. Scand., 1928, lxiii., 479.

[1] Medizinische Klink No. 33, August 17th, 1928, p 1279.
[2] H.M. Stationery Office. 15s.
[3] See THE LANCET, 1928, i., 141.

LOCAL MALARIA CONTROL IN BENGAL.

Birnagar or Ula, credited with being the place whence spread the disastrous malaria epidemic of 1856, is one of those half derelict towns so frequent in the upper Gangetic delta, with a population of 2300 in place of the 40,000 of 70 years ago before malaria, speaking without metaphor, laid it waste. Five years ago some inhabitants, stung by the position, formed a local public health society, whose keen honorary secretary has just issued one of his periodical reports.[1] Funds are supplied by considerable private subscriptions, by a substantial grant from the Bengal Government, and by a large gift of quinine from its director of public health. The antimalarial measures used have been the oiling of anopheline breeding-places and a wide administration of quinine. The difficulties encountered in this private enterprise have been those familiar when such campaigns have been attempted in India by Government officers. There has been some stubborn opposition to oiling, two and a half out of eight and a half miles of water edge in the small area actually covered having had to be left unprotected. These untreated tanks have bred larvæ profusely, and it is significant that while the municipal authority has contributed generously to the funds of the society, the municipal tank is not one of those which the society has been permitted to oil. Some of the observations made have a wide applicability. The washing of muddy water into tanks was followed by destruction of all larvæ, breeding recommencing immediately as it settled and cleared. While, apart from this, mosquitoes bred continuously they did not torment human beings during dry weather, but as soon as rain fell entered houses and bit, while the malaria-rate rose after the usual interval. It is believed that in dry weather the insects remained inactive in the all-embracing jungle, and that this is also the explanation of the immediate but temporary influx of mosquitoes into houses when neighbouring jungle is felled. Such clearance has been begun with sale of wood and cultivation of land, but permission for further clearance is being withheld by owners. The future is not looked forward to with hope. It is felt that the determination of the mosquito species most implicated locally in transmitting malaria requires more expert knowledge than is available on the spot, but it is, after all, improbable that the ungrudging coöperation of the Bengal Malaria Research Laboratory, already afforded in identifying larvæ, will not be extended to the dissection of mosquitoes locally collected, a subject particularly appropriate. It is believed, too, that the local campaign should be merged in a wider one to be undertaken, the writer suggests, by the District Board. If certain indications in the report are read aright it is questionable whether anything will replace adequately an enthusiastic local patriotism.

CHEMISTS AND BENZOL.

We owe to research in America, originated in industry,[1] the disclosure that benzol possesses definite toxic properties. When its fumes are regularly inhaled in a strength of 100 parts per 1,000,000 of air the hæmopoietic organs are attacked, and anæmia follows with decrease of polymorphonuclear leucocytes. Industrially benzol is used as a valuable solvent, particularly of rubber. Fortunately less toxic solvents, such as toluol, xylol, or high flash naphtha, can be substituted, and it has never come into widespread use in English factories. Now a useful note [2] of warning is given to chemists working in laboratories, who are notoriously careless about exposing themselves to unnecessary risks. They are urged to confine the use of benzol to testing, and to abolish it as a cleansing agent for which it is far too often used in profusion. If for any reason continued exposure is unavoidable, the chemist should place himself under medical examination once every month or two. Chemists tend to disregard the fact that the human body is a delicate reagent always ready to react when exposed to unsatisfied compounds, of which benzol is one.

THE PHYSIOLOGY OF FASTING.

Many religions exhort believers to fast for the good of their souls, and most unqualified and some qualified schools of medical thought advocate occasional fasting for the good of the body. There is no doubt that some degree of reduction in the diet produces excellent results in a great many persons, but there is much uncertainty about the mechanism by which these results are produced. Prof. P. F. Richter holds the view that for lack of knowledge of the physiology of hunger a valuable therapeutic weapon is being neglected. In a recent address[3] to the Berlin Society for the Study of Internal Medicine he dealt exhaustively with hunger from the clinical point of view. Its syndrome is, he says, primarily a defence mechanism. Deprived of a part of its supplies, the organism promptly adapts itself for work on a restricted intake. It reduces its combustion rate and institutes economy in all its departments. By lessening the pangs of hunger it enables itself to endure the new conditions as long as possible. Fasting is, therefore, an effective means of lowering the metabolic rate at need. One of the most important fields for its use is diabetes, and research into the biochemistry of hunger would almost certainly elucidate many diabetic phenomena which are as yet unexplained. What evidence there is suggests that the effect of hunger on the nerves and musculature is rather to improve their condition than to do them any harm. It causes a slight fall in blood pressure, but a constant level is soon reached. A change from a meat to a vegetarian diet, according to O. Müller and M. Gänsslen, quoted by Richter, improved the state of the peripheral circulation; this is because meat proteins cause spasm of the arterioles and dilatation of the capillaries, a condition which is rectified when they are removed from the diet. For

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[1] Malaria Control in Birnagar, 1927. By Krishnasckhar Bose.

[1] Greenburg, Leonard: Benzol Poisoning as an Industrial Hazard. Public Health Reports, Washington. July 2nd, 9th, and 23rd, 1926.

[2] Bloomfield, J. J.: Benzol Poisoning as a Possible Hazard in Chemical Laboratories. Public Health Report, Washington. July 20th, 1928.

[3] Deut. Med. Woch., 1928, i., 1067.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

I.

THE WIDAL OR AGGLUTINATION REACTION IN THE DIAGNOSIS OF INFECTIONS DUE TO ENTERIC GROUP OF MICRO-ORGANISMS.

By A. B. Rosher, M.R.C.S., D.P.H.,
DIRECTOR OF THE CHARING CROSS HOSPITAL INSTITUTE OF PATHOLOGY.

In order to estimate the value and limitations of the agglutination reaction in the diagnosis of these infections it is necessary to have some knowledge of the modern technique employed for the test and to appreciate the behaviour of agglutinins under certain conditions.

Macroscopic Method.

The macroscopic technique is nowadays almost invariably used in preference to the microscopic method. By this means the end-point of agglutination can be obtained more accurately, and there is no chance of the laboratory worker being infected, since dead bacilli are used instead of living ones. The test is very sensitive when this method is employed, and it is by no means uncommon to demonstrate agglutinins in a serum after it has been diluted 1/40,000 times. The highest dilution of patient's serum still having the power of agglutinating the bacilli is commonly called the "agglutinin titre." The criterion of diagnosis by the old-fashioned microscopic method was an agglutinin titre in the neighbourhood of 1/100, whereas agglutination to this titre could not by itself be regarded as diagnostic when the macroscopic technique is employed.

It is customary to put the patient's serum up against *B. typhosus*, *B. paratyphosus* A, B, and C, *B. enteritidis* Gaertner, and *B. aertrycke*. The vast majority of infections in this country are due to *B. typhosus* and *B. paratyphosus* B.

B. enteritidis Gaertner and *B. aertrycke* are the organisms usually associated with food poisoning when the symptoms of acute gastro-enteritis predominate, but on rare occasions are stated to give rise to febrile conditions resembling enteric in some respects.[1] [2] [3]

Collection of Blood.

More blood is required when the macroscopic test is employed, and this represents the only disadvantage of the method. Not less than 2 or 3 c.cm. of blood are desirable, and whatever method of collection is employed it is advisable that the tube or syringe into which it is collected should be perfectly dry and free from any chemical substance. otherwise the blood is likely to become hæmolysed and useless for the test.

If a syringe be used and sterilised by boiling or with alcohol and ether, it is essential to wash it out with sterile saline before withdrawing the blood. The blood is usually obtained either (1) by pricking the finger or thumb with a No. 2 triangular-pointed needle, a small indiarubber tourniquet having been previously applied to the base of the digit; or (2) by inserting a hollow needle into the median basilic vein and collecting the blood direct into a syringe or into a test-tube.

However, by using a Behring venule ample quantity of blood can be obtained quite easily, and the procedure is practically painless. Special venules are supplied for the diagnosis of enteric whereby blood is drawn from the patient for the agglutination test and blood culture simultaneously. thereby saving the patient the inconvenience of being punctured twice. Since the blood goes straight into the culture medium the risk of contamination is eliminated.

Technique.

Briefly, the technique is as follows:—

The blood is allowed to clot and, after centrifuging, the serum is drawn off. Various dilutions—e.g., 1/10, 1/20, 1/40, &c., to 1/1280—of the serum in normal saline are made in a series of test-tubes. The dilutions are made with graduated pipettes or by using Dreyer's dropping pipettes.[4]

Seven Dreyer's agglutination tubes[4] are then placed in a rack and 0·5 c.cm. of an emulsion of dead typhoid bacilli is put in each tube. (These emulsions are made by growing the organisms in bouillon for 24 hours, after which a small quantity of formalin is added to kill them. The emulsion is then standardised to contain so many organisms per c.cm., and if kept cool and in the dark can be used for some months.) Half a cubic centimetre of the 1/10 dilution of the patient's serum is now transferred to the first agglutination tube, and the same amount of the 1/20 to the second tube, and so on with all the dilutions. We now have a series of seven tubes containing a range of dilutions from 1/20 to 1/1280 of the patient's serum mixed with typhoid emulsion; each tube contains 1 c.cm. of fluid. The patient's serum is then put up against emulsions of paratyphoid bacilli in exactly the same manner, seven tubes being devoted to each organism. The rack is then placed in a water-bath at 55° C. for two hours or so. Agglutination usually commences in 10 to 15 minutes, and can easily be observed with the naked eye against a dark background. The contents of tubes showing no agglutination appear slightly cloudy, owing to the millions of bacilli in suspension, but when agglutination has occurred they become aggregated into large clumps which fall to the bottom of the tubes, resembling a precipitate, and the supernatant fluid is quite clear. The tubes are inspected occasionally, and if any organism is agglutinated in all dilutions up to 1/1280 further dilutions are put up—e.g., 1/2560, 1/5120, 1/10,240, &c.—so that the end-point of agglutination can be established.

Occurrence of Agglutinins in the Serum of Apparently Normal People.

If we test blood from these members of the population who have not been inoculated with T.A.B. vaccine and give no history of having had enteric against this group of organisms, we find that about 4 per cent. of them agglutinate *B. typhosus*, *B. paratyphosus* B and C, and *B. enteritidis* Gaertner, whereas about 10 per cent. react with *B. aertrycke* (Mutton).[5] The reason for this agglutination is unexplained, but it is possible that the people have passed through unrecognised infections with these organisms or closely allied ones. (A point in favour of this theory is the absence of people who can agglutinate *B. paratyphosus* A, for infections with this organism are extremely rare in the British Isles.) Some of these people may be carriers, for it is well recognised that the serum of the majority of carriers contains agglutinins; not enough cases have been investigated for any definite conclusions to be formed. The majority of sera give low agglutination titres, such as 1/20, 1/40, 1/80, but occasionally one finds a serum that will agglutinate when diluted as much as 1/640 times. As far as one can ascertain, these titres remain constant and do not fluctuate over a period of weeks.

Behaviour of Agglutinins as a Result of Infection.

Agglutinins do not appear in the blood until the end of the first week of disease, and therefore it is useless to expect any immediate diagnostic information from the reaction before this. Nevertheless, it is very important to perform the test during the first few days, since a negative result is invaluable in assessing the significance of results obtained later in the disease, especially in cases which only give low agglutinin titres throughout. However, it is during the early days that the chances of isolating the causative organism from the blood, fæces, &c., are best, and therefore cultures should also be made.

The agglutinins increase rapidly in intensity, reaching a maximum towards the end of the third week and then start to fall gradually (see Chart 1). They fade away over a period of months, but may last for years. There is a considerable variation in the amount of agglutinin production in different cases. Thus sometimes the highest agglutinin titre reached may be more than 1/40,000, whereas in other cases the maximum titre may be on the 1/100 mark. The of 567 per million living. The mortality-rates recorded in earlier epidemics were as follows :—

1848 .. 459	1892 .. 533	1918 .. 3078	1922 .. 563
1891 .. 574	1900 .. 504	1919 .. 1181	

From these figures it will be seen that the mortality in 1927 was the highest recorded since the great epidemic of 1918–19, and was but 7 per million below that of 1891. The increased mortality from pulmonary tuberculosis and heart and respiratory diseases may also be in part due to the prevalence of influenza. The death-rate from cancer was 1376 per million population, or 14 per million higher than in 1926, being the highest crude death-rate yet recorded. The 4907 deaths from suicide were equal to a rate of 125 per million, which is the highest recorded rate from this cause ; the rates in the three preceding years were 96, 105, and 114. The Review indicates the increasing use of lysol and coal-gas as means of self-destruction.

Prof. Robert Muir, Sir John Parsons, and Sir Charles Trevelyan have been appointed members of the Medical Research Council, succeeding Prof. G. Dreyer, Sir Archibald Garrod, and Mr. William Graham.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

(Dental Branch.)

In the Educational Number of The Lancet last week, when placing before our readers the advantages offered by joining this Service, we were unable to give the following current rates with regard to Dental Officers, the information not arriving in time for press.

On the completion of two years' service in the rank of Surgeon Lieutenant Commander (D), dental officers on the Active List are eligible for a three months' post-graduate course at a dental hospital and school at the public expense, and will draw full pay while attending the course.

Pay.—The current rates of full pay for Dental Officers are as follows :—

	£ £
Surgeon Lieutenant (D)	377–462
Surgeon Lieutenant Commander (D) (promoted after six years' service)	556–687
Surgeon Commander (D) (promoted by selection to fill vacancies in Establishment)	730–933
Surgeon Captain (D) (promoted by selection to fill vacancy in Establishment).. ..	1073–1329

The Regulations regarding Pension and Withdrawal Gratuities are the same as for Medical Officers in the corresponding Ranks.

HONORARY APPOINTMENTS TO THE KING.

The King has approved of the appointment of Lieut.-Colonel R. McCarrison, C.I.E., and Lieut.-Colonel W. H. Leonard to be honorary physicians to His Majesty, with the brevet rank of Colonel, in succession to Colonel C. R. Bakhle and Major-General A. A. Gibbs, retired ; and the appointment of Lieut.-Colonel G. D. Franklin, C.I.E., O.B.E., to be honorary surgeon to His Majesty, with the brevet rank of Colonel, in succession to Colonel R. W. Knox, D.S.O., retired.

RESTRICTED LEAVE OWING TO SMALL-POX.

Owing to the presence of small-pox in the area, restrictions have been placed on the granting of leave at Brechin (Forfarshire) and Kingston-upon-Hull. There are now two districts scheduled in London (St. Marylebone and Wandsworth) and 53 outside.

ROYAL NAVAL MEDICAL SERVICE.

To be Surg. Lts. : J. G. Ollerenshaw, T. W. Froggatt A. N. Forsyth, C. H. Birt, A. J. Burden, D. R. F. Bertram and D. L. Pow.

Sub-Lts. to be Lts. : B. E. W. Logan, J. B. G. Temple, K. H. Fraser, and H. C. Browne.

The following appts. are notified : Surg. Comdrs. C. F. O. Sankey to *Barham*, and to *Warspite* (on transfer of flag) ; and G. H. Hayes to *Ramillies*. Surg. Lts. J. Johnston to *Resolution* ; L. P. Spero to *Dahlia* ; H. J. McCann to *Pembroke* for R.N. Barracks, Chatham, temp. supy. ; V. G. Horan to *Heliotrope* ; C. B. Fox to *Rodney* ; D. R. Campbell to *Iroquois* ; I. J. Corbett to *Victory* for R.N. Barracks, Portsmouth, temp. ; and S. J. Savage to *Pembroke* for R. N. Hospital, Chatham, temp.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. W. J. Payne and Surg. Lt. R. L. Stubbs to *Victory*, for R.N. Hospl., Haslar, for training.

ROYAL ARMY MEDICAL CORPS.

Maj. G. S. Parkinson retires on retd. pay and is granted the rank of Lt.-Col.

Maj. J. St. A. Maughan to be Lt.-Col., vice Lt.-Col. W. C. Croly to retd. pay.

Capt. J. Vallance, Reg. Army Res. of Off., relinquishes his appt. and resumes the rank of Maj.

Capts. R. H. C. Pryn and T. L. Henderson to be Majs.

Capt. B. C. W. Pasco, late R.A.M.C., to be temp. Capt., and temporarily relinquishes the rank of Capt.

Lts. (on prob.) W. R. C. Spicer, J. H. Anderson, T. F. M. Woods, S. M. Burrows, G. T. L. Archer, M. R. Burke, P. J. L. Capon, D. R. W. Burbury, K. McNeill, P. Dwyer, P. W. A. Agnew, and J. W. Kendall are confirmed in their rank.

The undermentioned Lts. from the secd. list are restd. to the estab. : L. R. S. MacFarlane and W. F. Lane.

To be Lts. on prob. : Lt. A. T. H. Marsden, from R.A.M.C. (T.A.) ; 2nd Lt. L. R. H. Keatinge, from T.A. Res. of Off., Gen. List ; Temp. Lt. G. L. Grieve, and relinquishes the temp. rank of Lt.

The undermentioned Lts. on prob. are secd. : F. Welsh, N. J. Nicholson, H. W. Daukes, and D. C. MacE. Macpherson.

ARMY DENTAL CORPS.

Capt. A. Gibson to be Maj.

Temp. Lt. H. Quinlan, Dental Surg., Gen. List, to be Lt.

ARMY RESERVE OF OFFICERS.

Cols. J. W. Leake and F. Ashe, having attained the age limit of liability to recall, cease to belong to the Res. of Off.

Maj. J. H. Barbour, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Maj. E. T. Burke resigns his commn. and is granted the rank of Lt.-Col.

Capt. J. V. Bates to be Lt.-Col. and to comd. the 131st (Home Counties) Fd. Amb., vice Lt.-Col. P. J. Gaffikin, vacated.

Capt. E. B. Hinde resigns his commn. and is granted the rank of Maj.

2nd Lt. W. E. Hayes (late R.E.) to be Lt.

Supernumerary for service with O.T.C. : Capt. H. P. Malcolm to be Maj.

ROYAL AIR FORCE.

Flight Lt. A. F. Cook is seconded for duty with the Transjordan Frontier Force.

Flying Officer E. A. Rice is promoted to the rank of Flight Lt.

Flight Lt. C. Sempill de Segundo relinquishes his temporary commission on completion of service.

RESERVE OF AIR FORCE OFFICERS.

Squadron Leader E. P. Punch relinquishes his commission on completion of service.

INDIAN MEDICAL SERVICE.

Lt.-Col. T. Hunter retires.

Guy's Hospital.—The annual report upon the work of Thomas Guy's foundation shows that in 1927 11,313 in-patients were admitted, an increase of 1000 over the previous year. There were 122,446 new out-patients who made 537,676 attendances : they cost 7*s.* each. The in-patients cost £11 19*s.* 2*d.* each. The total income was £164,000 and the expenditure £172,000 ; the accumulated adverse balance of expenditure over income now exceeds £100,000, and an appeal is being made for £500,000 for the re-endowment of the hospital.

be capable of demonstration, whereas the causative organisms can only be isolated from the blood in from 70 to 80 per cent. of cases. and from the fæces in about 50 per cent. A blood culture when positive is the most satisfactory means of diagnosis, because it gives conclusive proof of infection, while the agglutination reaction only gives indirect proof. The presence of typhoid or paratyphoid bacilli in the fæces or urine means that the patient is either a carrier or is suffering from an active infection with these organisms, and it is permissible to assume an active infection if the symptoms are sufficiently suggestive.

Each method of diagnosis, therefore, has its limitations, and in order to obtain the best results it is essential on encountering a suspected case: (1) to make cultures from the blood, fæces, urine, and sputum (if present); (2) to perform an agglutination reaction; (3) to perform a leucocyte count. These three investigations should be carried out whatever the stage of disease. The leucocyte count is invaluable because it takes very little time to perform, and if a leucopenia is present one can usually rule out most of the infections likely to resemble enteric clinically, with the exception of influenza. The result of the agglutination reaction should be obtainable in two or three hours, but isolation and identification of the causative organism may take some days.

The Diagnosis of Bacterial Food Poisoning.

The agglutination test also has some value in the diagnosis of bacterial food poisoning. These infections are usually due to various types of *B. aertrycke* and to *B. enteritidis* Gaertner. Blood cultures are of very little value, and the diagnosis is usually made by isolating the causative organism from the fæces. The agglutination reaction affords valuable support, but needs to be interpreted with care, owing to the "normal" people who agglutinate these organisms; furthermore, people who have been inoculated with T.A.B. frequently agglutinate *B. aertrycke* and *B. enteritidis* Gaertner, owing to the close serological relationship of members of this group of bacilli.

However, this non-specific or group agglutination as regards *B. aertrycke* can be avoided by using type emulsions, as shown by Andrewes.[9]

Conclusion.

In conclusion, attention must be drawn to the importance of supplying the bacteriologist with brief details of the case under investigation, especially regarding the duration of the disease, inoculation, and so forth. Neglect to do this is, no doubt, responsible for the complaints sometimes made by practitioners of incomprehensible laboratory reports. The successful diagnosis of enteric can only be accomplished by close coöperation between the clinician and the laboratory worker.

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MARIE CÉLESTE SAMARITAN SOCIETY.—During the first six months of the present year this society, which was established to help patients of the London Hospital, assisted 6739 persons, an increase of 402 as compared with the corresponding period of last year. Surgical appliances have been supplied to 2625 patients, and 1323 have been sent to the sea or the country.

TREASURER OF RADCLIFFE INFIRMARY.—The Rev. G. B. Cronshaw, upon his appointment as Principal of St. Edmund Hall, has resigned the treasurership of the Radcliffe Infirmary, which he has held for the last 18 years. During that period the hospital, by reason of his energy and activity, has been greatly improved and its usefulness widely extended. In recognition of his services Mr. Cronshaw has been made a vice-president.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT CARDIFF.

(Continued from p. 351.)

SECTION OF MEDICAL SOCIOLOGY.

THE FALLING BIRTH-RATE.

Prof. W. J. ROBERTS (University College, South Wales), in opening the subject from

The Economic Aspect,

referred to the writings of Malthus, and stated that nowadays no simple and definite theory as to the law of population held the field. Official statistical data threw no light on the means by which the reduction of births was secured. Apprehensions had found expression with respect to the decline of the French population, and in the U.S.A. as to the higher birth-rate among unassimilated immigrants when compared with the pure Americans. It was also believed that in Britain birth control prevailed more widely among the relatively better situated. Sir Arthur Newsholme had dealt with the thesis that it was not a matter of indifference as to which races peopled the unfilled portions of the world and took the preponderant share in shaping the destinies of mankind. He had also referred to the fact that in the earlier years of certain industries each child was his parents' savings bank, and that now the child was a less profitable asset than in the past. Economic inquiry tended to destroy utterly the impression that the people of this island were divided by social circumstances into breeds, some of which were fitted by origin and nature to bear rule over the others. The economist wished to have many questions answered, both by the biologist and the social investigator. For example: Are the "comfortable classes" the result of biological excellence? Are the classes which exhibit aptitude for leadership and command in danger of perishing if their stock is not continued? The obstacles to the growth of population and the causes of misery and restricted livelihood in the mass of the people are not due to any law of population or to the niggardliness of nature. Neither our own little planet nor our own little island was overcrowded. The causes were rather to be sought in habits and institutions whose origin and purpose was mastery, privilege, and monopoly. The continuous unfolding of productive capacity depended on the prevalence of justice throughout the whole economic community. He did not pretend to any social or medical knowledge, but as an economist would like answers to many questions. How did gambling or the desire to get rich quickly operate? What was the effect of outdoor games and a life of pleasure on fertility? What was the effect of the conventions of each social class on its individuals? Did people follow medical advice on these subjects? And did people really know why they acted in a certain way? The term "overcrowding" was used very loosely, the standards adopted were rough, and halving of the population did not necessarily diminish overcrowding, even if the number of houses remained the same. Ordinary economic explanations were of no avail for this problem, and far more detailed inquiry and intelligent questioning of all classes by people who could put themselves in other peoples' places was needed.

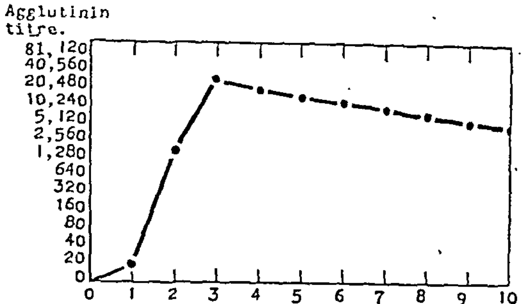
The Biological Aspect.

Prof. F. A. E. CREW (Animal Breeding Research Department, University of Edinburgh) said the birth-rate of this country had fallen and was still falling, and that this was a matter of grave concern to those who chose to envisage the overwhelming of our prized culture by hordes of barbarians of this or that particular hue, but all equally and amazingly fertile. To the biologist, however, there was nothing remarkable and nothing necessarily ominous in this decline. If the conclusions which had emerged from the work of Pearl, Elton and others had been known when the birth-rate was soaring, the present fall would have latter event is unusual, and this is fortunate, since in these cases a diagnosis cannot be established on a single test, and repeated tests have to be performed (see below)..

Behaviour of Agglutinins Resulting from Protective Inoculation.

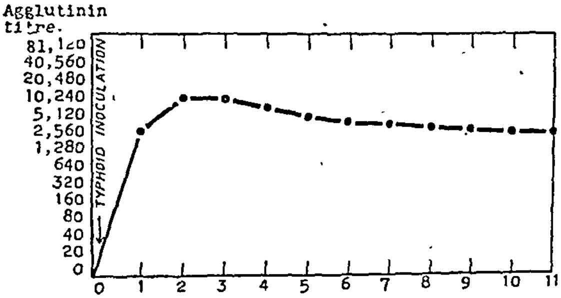
As a result of inoculating a person with a vaccine prepared from typhoid and paratyphoid bacilli (T.A.B.), agglutinins to these various organisms appear in the serum (see Chart 2). They reach their maximum after two or three weeks, and then usually fall to a level round about the 1/500 mark; here they remain for many years, and in some cases no doubt for a lifetime. The tendency is for them to get less as time goes on, but the process is so gradual that when tests are made once a week for several weeks and no change in agglutinin titre can be demonstrated. There is considerable evidence[6] to show that nothing will cause any fluctuation of the agglutinin titre at this stage unless a person becomes infected with one of the enteric group of bacilli. In the event of this happening the agglutinins for the infecting organism rapidly rise and reach a maximum towards the end of the third week. Then they gradually fall, and in all probability become stationary once again on a level somewhat higher than they were before the infection took place. Thus the behaviour of the agglutinins in a person suffering from enteric infection is the same whether the person has been inoculated or not, except that in the inoculated they start from a definite level (see Chart 3), whereas in the uninoculated they start from zero.

CHART 1.



Showing the behaviour of agglutinins during an infection. Note the rapid rise in the second and third weeks.

CHART 2.



Showing the behaviour of agglutinins resulting from inoculation.

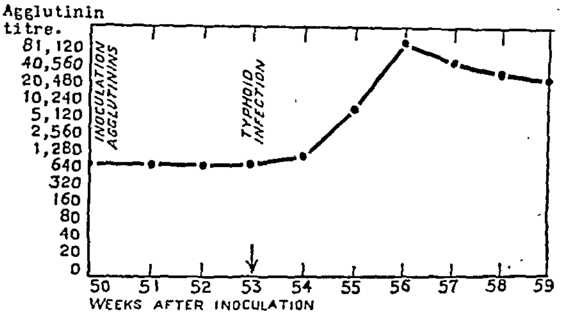
Diagnosis of Infection Agglutinins.

If we are confronted with a serum which agglutinates one or more of these organisms it should be clear from the above remarks that the agglutination may be due to: (1) "normal" agglutinins; (2) infection agglutinins; (3) inoculation agglutinins; (4) a combination of the above. It then becomes necessary to distinguish infection agglutinins from the remainder. One can usually rule out inoculation agglutinins by questioning the patient; but, apart from this, the fact that a serum agglutinates the three organisms, *B. typhosus*, *B. paratyphosus* A and B, is usually sufficient indication that inoculation has taken place.

The essentials for diagnosis *in the uninoculated* must then be considered. A titre of 1/1000 must always be regarded as strongly suspicious, and if it is considerably higher than this a presumptive diagnosis of infection can be made. It must be remembered, however, that occasionally titres as high as this are not registered even when the agglutination is at its maximum at the end of the third week. In these cases it is necessary to perform two or even three tests with an interval of three or four days between them; if there is any appreciable increase or decrease in titre (according to the stage of the disease) a diagnosis of infection is justified. The occurrence of these cases makes it of the utmost importance to test the blood in the first few days of disease, for if it is then negative and a few days later agglutinins appear, a diagnosis of infection is justified, even if the titre of the second test is only on the 1/20 or 1/40 mark.

The diagnosis by means of repeated tests is fairly easy during the first three weeks of disease, since the rise in agglutinins is rapid; but after this period it is less satisfactory, and may be a lengthy procedure, for the fall in agglutinins may be very gradual.

CHART 3.



Showing the behaviour of the agglutinins in the case of an inoculated person becoming infected. This chart gives an idea of what would happen to the agglutinins if a person became infected with *B. typhosus* 53 weeks after being inoculated.

In the inoculated a single test by itself is of very little value, and it is essential to perform, at any rate, two tests with an interval of three or four days between them in order to demonstrate the fluctuation in titre characteristic of infection. As has been noted above, after inoculation agglutinins have settled down to a steady level no change can be detected in them over a short period unless the patient becomes infected with organisms of the enteric group.

Value of the Test.

The agglutination reaction thus has a definite value in the diagnosis of these infections, and may be even more useful in the future. The work of E. Weil and A. Felix[7] and others has shown that typhoid and paratyphoid bacilli contain two kinds of antigen, which differ in their resistance to heat and to certain chemical agents. These, for reasons which do not concern us here, have come to be called the H and O antigens. It has been claimed by Felix that agglutinins acting on the O antigens appear only as a result of infection, and that, by using an emulsion containing O antigens, it is possible to arrive at a diagnosis on the result of a single agglutination test even in an inoculated individual. Burnet[8] has recorded similar results. If these observations are widely confirmed by future investigations they will clearly make an important advance in the diagnostic application of the test.

The great value of the agglutination test, compared with other methods of diagnosis of these infections, is the fact that agglutinins after the first week or so are almost always present, and therefore should be capable of demonstration, whereas the causative organisms can only be isolated from the blood in from 70 to 80 per cent. of cases, and from the fæces in about 50 per cent. A blood culture when positive is the most satisfactory means of diagnosis, because it gives conclusive proof of infection, while the agglutination reaction only gives indirect proof. The presence of typhoid or paratyphoid bacilli in the fæces or urine means that the patient is either a carrier or is suffering from an active infection with these organisms, and it is permissible to assume an active infection if the symptoms are sufficiently suggestive.

Each method of diagnosis, therefore, has its limitations, and in order to obtain the best results it is essential on encountering a suspected case: (1) to make cultures from the blood, fæces, urine, and sputum (if present); (2) to perform an agglutination reaction; (3) to perform a leucocyte count. These three investigations should be carried out whatever the stage of disease. The leucocyte count is invaluable because it takes very little time to perform, and if a leucopenia is present one can usually rule out most of the infections likely to resemble enteric clinically, with the exception of influenza. The result of the agglutination reaction should be obtainable in two or three hours, but isolation and identification of the causative organism may take some days.

The Diagnosis of Bacterial Food Poisoning.

The agglutination test also has some value in the diagnosis of bacterial food poisoning. These infections are usually due to various types of *B. aertrycke* and to *B. enteritidis* Gaertner. Blood cultures are of very little value, and the diagnosis is usually made by isolating the causative organism from the fæces. The agglutination reaction affords valuable support, but needs to be interpreted with care, owing to the "normal" people who agglutinate these organisms; furthermore, people who have been inoculated with T.A.B. frequently agglutinate *B. aertrycke* and *B. enteritidis* Gaertner, owing to the close serological relationship of members of this group of bacilli.

However, this non-specific or group agglutination as regards *B. aertrycke* can be avoided by using type emulsions, as shown by Andrewes.[9]

Conclusion.

In conclusion, attention must be drawn to the importance of supplying the bacteriologist with brief details of the case under investigation, especially regarding the duration of the disease, inoculation, and so forth. Neglect to do this is, no doubt, responsible for the complaints sometimes made by practitioners of incomprehensible laboratory reports. The successful diagnosis of enteric can only be accomplished by close coöperation between the clinician and the laboratory worker.

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MARIE CÉLESTE SAMARITAN SOCIETY.—During the first six months of the present year this society, which was established to help patients of the London Hospital, assisted 6739 persons, an increase of 402 as compared with the corresponding period of last year. Surgical appliances have been supplied to 2025 patients, and 1323 have been sent to the sea or the country.

TREASURER OF RADCLIFFE INFIRMARY.—The Rev. G. B. Cronshaw, upon his appointment as Principal of St. Edmund Hall, has resigned the treasurership of the Radcliffe Infirmary, which he has held for the last 18 years. During that period the hospital, by reason of his energy and activity, has been greatly improved and its usefulness widely extended. In recognition of his services Mr. Cronshaw has been made a vice-president.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT CARDIFF.

(Continued from p. 351.)

SECTION OF MEDICAL SOCIOLOGY.

THE FALLING BIRTH-RATE.

Prof. W. J. ROBERTS (University College, South Wales), in opening the subject from

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referred to the writings of Malthus, and stated that nowadays no simple and definite theory as to the law of population held the field. Official statistical data threw no light on the means by which the reduction of births was secured. Apprehensions had found expression with respect to the decline of the French population, and in the U.S.A. as to the higher birth-rate among unassimilated immigrants when compared with the pure Americans. It was also believed that in Britain birth control prevailed more widely among the relatively better situated. Sir Arthur Newsholme had dealt with the thesis that it was not a matter of indifference as to which races peopled the unfilled portions of the world and took the preponderant share in shaping the destinies of mankind. He had also referred to the fact that in the earlier years of certain industries each child was his parents' savings bank, and that now the child was a less profitable asset than in the past. Economic inquiry tended to destroy utterly the impression that the people of this island were divided by social circumstances into breeds, some of which were fitted by origin and nature to bear rule over the others. The economist wished to have many questions answered, both by the biologist and the social investigator. For example: Are the "comfortable classes" the result of biological excellence? Are the classes which exhibit aptitude for leadership and command in danger of perishing if their stock is not continued? The obstacles to the growth of population and the causes of misery and restricted livelihood in the mass of the people are not due to any law of population or to the niggardliness of nature. Neither our own little planet nor our own little island was overcrowded. The causes were rather to be sought in habits and institutions whose origin and purpose was mastery, privilege, and monopoly. The continuous unfolding of productive capacity depended on the prevalence of justice throughout the whole economic community. He did not pretend to any social or medical knowledge, but as an economist would like answers to many questions. How did gambling or the desire to get rich quickly operate? What was the effect of outdoor games and a life of pleasure on fertility? What was the effect of the conventions of each social class on its individuals? Did people follow medical advice on these subjects? And did people really know why they acted in a certain way? The term "overcrowding" was used very loosely, the standards adopted were rough, and halving of the population did not necessarily diminish overcrowding, even if the number of houses remained the same. Ordinary economic explanations were of no avail for this problem, and far more detailed inquiry and intelligent questioning of all classes by people who could put themselves in other peoples' places was needed.

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Prof. F. A. E. CREW (Animal Breeding Research Department, University of Edinburgh) said the birth-rate of this country had fallen and was still falling, and that this was a matter of grave concern to those who chose to envisage the overwhelming of our prized culture by hordes of barbarians of this or that particular hue, but all equally and amazingly fertile. To the biologist, however, there was nothing remarkable and nothing necessarily ominous in this decline. If the conclusions which had emerged from the work of Pearl, Elton and others had been known when the birth-rate was soaring, the present fall would have been foreseen and accurately predicted. The growth of all living things, whether pumpkins or peoples, followed the law enunciated by Pearl—namely, that the population at first grows slowly, gradually gains impetus, and then grows rapidly. Rapid growth is succeeded by a slowing off which ends in no growth at all. Increasing density led ultimately to complete saturation, and reduction in population was achieved by removing the surplus or by reducing the rate of growth. The first method of reduction was the catastrophic and was exemplified in rabbits, mice, and human populations, the catastrophic instruments being war, pestilence, and famine. The second or gradual method of reduction was revealed in the work of Pearl on Drosophila, the primary factor being a fall of fecundity and fertility with increasing density. Among pigs under similar conditions there was noticed a reduction in the size of the litters. Group biology was a new study. Experiments with animals did not necessarily apply to human beings. Man could adapt himself to a changed environment, and every advance in knowledge which enabled him to derive from his environment things conducive to his material welfare increased the potentialities for population growth in a given area. A rising birth-rate heralded an extension of the conquest of man of his environment, while a falling birth-rate was an indication that mankind was temporarily imprisoned. The birth-rate was now falling because this was the end of a population growth-cycle. A new growth-cycle would be initiated and the birth-rate would rise when those factors which were at present overriding the inherent tendency to increase were recognised or removed.

Fecundity was affected by inborn and environmental factors and different races, stocks, and individuals were distinguished, one from the other, by true-breeding differences in fecundity. In the human subject the tendency to multiple births was faithfully transmitted through both male and females. The time of onset of puberty and of the climacteric and also longevity were true-breeding characters. It was possible that in the past the inherently longer-lived had contributed disproportionately to the population, and that under modern conditions the shorter-lived lived longer and transmitted to their progeny a lowered fecundity. This would be a reasonable explanation of a lowered birth-rate if it could be shown that there was a high correlation between longevity and high reproductive rate. This country was now relatively overcrowded. Lack of houses was an indication of a relative regional over-population. If the builders failed to keep pace with the babies the birth-rate would fall. It was not known how density provoked its results, but the work of Pitt-Rivers suggested that sheer discouragement was enough to destroy a people.

What effect had the conflict of cultures? The birth-rate of the vanishing peoples of the South Seas was steadily falling, apparently because these peoples were discontented and discouraged, and consequently dying out. Did the arrival of an immigrant Irishman in Glasgow prevent a Scottish baby from being born? There must be joyousness, eagerness, roominess for potential parents or else the babies would not come. The birds, when they mated, built nests, but for human lovers the tenements were built by those who were ignorant of the relation which existed between population density and the reproductive rate. The sex ratio could not as yet be controlled. The fact that many women could not become mothers could not explain the falling birth-rate. A high marriage-rate associated with a low per-reproductive-woman birth-rate could yield the same reproductive rate as a low marriage-rate associated with a high per-reproductive-woman birth-rate. Few marriages and larger families might yield a high reproductive rate with less variety among the offspring and surely variety was to be desired. The present low birth-rate was in part due to sterile marriages. Two individuals mutually sterile might be fruitful in other matings. Possibly recent social and economic developments had encouraged the survival of stocks, which were relatively infecund or which reacted more readily to the disharmonies of industrialism. The peak of sexual activity was at about 29 in the male and the woman's reproductive power dropped shortly after 30.

Prosperity implied plentiful food and comforts, and therefore a lower death-rate and a rising birth-rate, and an unequally distributed prosperity might create differential fertility among the social grades. If a large section of the community were relatively unsuccessful and left with no other modes of nervous release than excessive drinking and sexual over-indulgence, there would be a higher reproductive rate, in this section than among the community as a whole. Social advancement implied a lower reproductive rate, as those who experienced it were presented with more varied modes of self-expression and self-indulgence. Unless it could be shown that the methods adopted for birth control were effectual, it could not be accepted that birth control was largely responsible for a fall in the birth-rate. The fall in the birth-rate had been too gentle; it had proceeded with evolutionary steadiness and had been universal. This suggested the expression of some biological factor. He doubted if birth control had affected the crude birth-rate, but suggested that it might have slammed the doors of suburban houses to open those of a slum. The problem, thus, was to determine the biological worthiness of the social grades. What was fitness? There was no reason to suppose that it was linked with high-grade fecundity. The elephant and the earwig were fit and had quite different reproductive rates. Was the human standard of fitness to be good physique, good brain, and low-grade fecundity? If so, this ideal could be found abundantly among all social grades. The suggestion that the relatively unfit were more abundant among the socially submerged was not necessarily true. It was easier for a good man to climb out of the gutter than for a biologically unworthy scion of an established family to descend because the latter was buoyed up by his associates. If birth control had played a part, it would have been well for humanity if it had been the only responsible agent, used intelligently by a people, who knew what they did and why they did it. At present it seemed that the methods adopted were too uncertain to allow of any policy being based upon them. In his concluding remarks Prof. Crew said he had tried to be provocative and had incautiously stepped from the solid ground of fact to the uncertain terrain of opinion, but that he set no great store on his opinions and would not mind exchanging them for better ones.

The Medical Aspect.

Sir THOMAS HORDER thought the falling birth-rate was a matter outside the province of medical men. They must have more facts from the biologist and the economist. Sex incompatibility was a mystery and the laws of reproduction were inscrutable. The prolongation of life was a small matter, but the saving of life and the improvement of health were great matters. Old age was on the increase. We had a lower birth-rate and would ultimately have a higher death-rate. A visitor from another planet would be amused to find us worrying over a falling birth-rate when so recently we were complaining of the rapid increase of the population. He did not think the differentiation of the birth-rate resulting in poorer quality came within the doctor's sphere. The husband and wife usually consulted the doctor when they had made up their own minds on this matter. If the doctor was to enter this field he must be taught very differently. If they were to breed from superior parents Government would have to fix a minimum of, say, three children with a double minimum for very superior parents, and subsidies would have to be provided from those who did not comply with the minimum. Sociologists must arouse interest in eugenics before the doctors could take a hand. The profession had stood aloof owing to want of data.

Lady BARRETT (London) dissented from Sir Thomas Horder's view that this was not a matter for the medical profession. She gave many statistics with regard to the fall in the birth-rate, and also gave statistics with regard to the fertility of women according to their age at marriage, derived from the experience of Scotland in 1855. She concluded that 25 was the best age for marriage. If the true facts were known with regard to the chances of immediate conception many more young couples would begin their married life in a natural manner. If there was danger to the mother from childbearing the family doctor was the best person to advise. Medical students should be taught all that was known on this subject in order that they might give suitable advice to their patients. Unless the medical profession took an interest in this problem and spoke out there was a great danger of race deterioration as the result of the differential birth-rate.

Discussion.

Dr. **William Collier** (Oxford) said that for 40 years birth control had been practised in the professional classes, and they had no right to deny information to the working classes. If medical science set itself to improve methods they would be improved. They must not sit on a hedge because the subject was distasteful. Panel practitioners had no time to advise, and should refer their patients to good clinics. A first-class birth control clinic had been inaugurated at Cambridge under medical direction, but in spite of the support of the Oxford Medical Society they had met with much opposition and had been unable to establish one at Oxford.

Dr. **Letitia Fairfield** said that the doctor's training gave him no locus standi. More biological data were wanted. Causes of the falling birth-rate were voluntary and involuntary, but the involuntary causes were not really natural laws. Joy in life produced the desire for children, and regard for the health of the mother produced a reasonable form of birth control. She did not think they need worry about the falling birth-rate.

Dr. **Binnie Dunlop** (London) said there was a real demand for information on this subject, and caused some amusement by his suggestion that there should be no more children till all the adults had been satisfactorily provided for.

Mrs. **Neville Rolfe** dealt with the effect of motivation. The birth-rate in Italy had declined, but it remained high in China and among the Jews, from religious motives. The necessary fillip to the birth-rate referred to by Prof. Crew could readily be supplied by emigration. We had areas crying out for white population, and we ought to emigrate good stock. Under the 1922 Act local authorities could train, equip, and emigrate, but they only emigrated boys. They should go in for group emigration with unbroken British family traditions. Local authorities should send out girls and boys in equal numbers. Emigration was the best means of stemming the decline in the birth-rate.

Dr. **N. E. Waterfield** (Banbury), from his experience as a general practitioner, thought parents asked for and acted on the doctor's advice.

Reply.

Prof. **Roberts** asked if social conditions were just, and suggested that many of these problems would be solved if the ideals of the community were raised.

Prof. **Crew** agreed with the importance of the motivating force, and said a new religion was needed. Emigrants should be successful people at the reproductive age.

SECTION OF PREVENTIVE MEDICINE.

CONTROL OF INFECTIOUS DISEASE.

The value of present methods of controlling infectious diseases was discussed under the presidency of Dr. **E. Colston Williams** (Cardiff).

Small-pox.

Dr. **L. J. Rajchmann** (Director of the Health Organisation, League of Nations) surveyed the behaviour of small-pox in the various countries of the world. Events at Rio de Janeiro in 1926, and in Algeria in 1926 and 1927, showed, he said, that severe outbreaks of small-pox had not ceased to occur. During 1927 a large area of Europe was free from small-pox; since 1919 there had been a huge drop in its prevalence in Rumania and Soviet Russia; in each case notification had improved. In the Far East there had also been a drop. During the late war England and France remained clear; in Germany in 1917 the barriers against small-pox broke down, and this was much more the case in Austria, Hungary, and Italy. The crest was reached in 1920; after that came the decline. In 1927 there were no cases in 15 European countries, and very few in 15 others. In France, in spite of efficient vaccination, the prevalence was said to be kept up by imported cases. In France, Germany, and Italy the disease was of the classical type. In Switzerland a mild type of small-pox, similar to that in England at present, was prevalent from 1921 to 1926, but has now entirely disappeared. The case mortality of small-pox varied greatly not only between one country and another, but also from year to year. Italian statistics were particularly interesting, and showed that the severity of the disease and its case fatality underwent cyclical variation, roughly in seven-year periods. There was no evidence that the classical type was being replaced anywhere by the mild type. The case fatality in England from the mild type was now between 0·2 and 0·3 per cent. In Germany during 1919 to 1922 the case fatality varied from 12 to 16 per cent. In France the case fatality was between 28 and 29 per cent. from 1919 to 1921. In Rumania the figure of 28 per cent. for 1919 became 12 per cent. in 1923. In extra-European countries the figure varied from 10 to 30 per cent. In India and Korea during 1926 and 1927 it was about 25 per cent. In Java the figure 26 per cent. in 1918 fell to 12 per cent. in 1923, and was only 2·7 per cent. in 1927—a very low figure for a tropical country. Figures for Africa show that a low case fatality of 2 to 10 is not uncommon, but that severe epidemics with a 30 per cent. mortality do occur. In European countries there are no statistics for trustworthy death-rates according to age-periods, but the Italian statistics show a marked excess of the female rate at ages from 20 to 44. Owing to the influence of the vaccinal condition it is difficult to determine whether fluctuations due to any other cause occur. The seasonal distribution of the mild and severe types did not differ materially.

Dr. **J. Middleton Martin** (Gloucestershire) pointed out that mild small-pox was no new thing, and that in the past inoculation had come into fashion when the type of the disease was mild. The tendency to regard infection as being spread by persons rather than by infected articles was growing, and belief in aerial spread of infection was practically given up. Their main business was to prevent case to case infection. Their principal difficulty was the detection of mild small-pox. Small-pox was not a dual disease but one disease of varying severity. The percentage of vaccinated school-children in Gloucestershire had dropped from 70 to 25, and their present means of control depended upon quickness in detection.

Dr. **T. Eustace Hill** (Durham County) had no doubt that the mild disease was true small-pox. They had had 12,634 cases from 1922 to May 31st, 1928, with 34 deaths. Of the 34 deaths, 6 occurred under 1 month of age, 4 under 3 months, 2 at 1–2 years, 3 at 2–5 years, 3 at 5–15 years, 5 at 15–25 years, 1 at 25–45 years, 5 at 45–65 years, and 5 at 65 and upwards. The cost to the county had been £120,000, but nevertheless he thought they ought to continue isolating the cases as they could not trust to the mild disease breeding true. Discussing methods of control, he argued that it was impossible to make vaccination compulsory at present. He paid tribute to the valuable work done by the port sanitary authorities. Wilful concealment and failure to diagnose impeded prompt notification. All medical officers of health should make themselves expert in diagnosis. and county medical officers of health should act as consultants. The supervision of contacts was not always efficient. They had successfully pooled the hospital accommodation in Durham County, and they had not found that overcrowding the hospitals had caused septic cases. "Return" cases had occurred owing to the demand for hospital accommodation. Disinfection was still advisable. He had had no experience of the supposed relation between encephalitis and vaccination. (Dr. Rajchmann in his opening remarks mentioned that a Special Commission of the League of Nations was at present investigating this matter.)

Dr. R. P. GARROW (Chesterfield) explained the continuous prevalence of small-pox in this country by the extraordinary mildness of the cases. Even confluent cases were not ill. The refusers of vaccination were of the lowest class. He suggested the omission of hospital isolation and the treatment of cases at home with vaccination of the contacts. At the present time in his district it was considered preferable to have a pleasant three weeks in hospital with small-pox than to suffer from vaccination at home. He believed that the mild type was a separate disease, and that even if it did change its type the occurrence of a few deaths would stimulate the demand for vaccination.

Dr. R. BRUCE LOW (Ministry of Health) thought the mild type was not so trivial, and was apt to be fatal to the newly born; he urged the need for stamping out the disease, and showed that the present failure was caused by the well-tried preventive methods not being properly enforced. He suggested that owing to the mildness of the disease the general practitioner regarded it with scorn; the cases were not promptly removed, the contacts were not followed up carefully, and there was no propagandism with regard to vaccination. He suggested that the mild type was more easily stamped out because it was less infectious, and that supervision of contacts should be extended from 16 to 20 days because the appearance of the rash was frequently delayed. To show that the mild type was no new thing he quoted from the letter of a doctor in 1722: "one type of small-pox the nurse cannot kill and one type the doctor cannot cure."

Sir MALCOLM WATSON (Malaya) showed how small-pox had been stamped out in the Malay States by efficient vaccination, and suggested the advisability of postponing vaccination till after the first year of life.

Dr. A. E. BRINDLEY (Derby) emphasised the large amount of concealment of the disease which went on.

Prof. HAROLD KERR (Newcastle-on-Tyne) said that contacts dreaded vaccination more than the disease, and hoped that it would be possible to reduce the virulence of the lymph even if it shortened the period of immunity. His town gave compensation to those who were laid off work owing to vaccination. He mentioned the case of seven painters who were exposed to infection and vaccinated. Three were off work, one of them for 11 weeks, and received their wages all the time. He did not agree with Dr. Garrow's proposal to leave the cases at home. The medical officer of health of a neighbouring district had refused to believe that the disease was small-pox. As a result infection spread to Newcastle and the consuls arranged for ships to be taken to other ports. In any ordinary big town the mild type of the disease could be controlled without difficulty.

Dr. R. M. F. PICKEN (Cardiff) said that better-class persons were also refusing vaccination. It was impossible to get efficient vaccination and revaccination against this mild type of the disease. Stunts for the vaccination of the whole population would only make us a laughing stock.

Diphtheria and Scarlet Fever.

Dr. R. A. O'BRIEN gave many instances to show how outbreaks of diphtheria could be prevented and controlled in resident schools and among hospital staffs, and went on to discuss some of the failures to apply our present knowledge. If antitoxin were given in the first 24 hours of the disease there would be no deaths from diphtheria. Statistics from the U.S.A. and from the reports of British medical officers of health showed that there was much delay of parents in calling in the doctor, much delay of doctors in making a diagnosis, further delay in waiting for the examination of the swab, and that frequently in the end an ineffective dose was given. Recent work showed that out of a thousand Schick-negative cases 97 per cent. remained negative after periods varying from one to seven years. Immunised persons who became Schick-positive rapidly regained their negativity with a Schick test. Three doses at intervals of one week was still the best method administratively, but it was possible to give the Schick test and the first immunisation dose simultaneously. Some persons became immune after the first dose and some after the second. Dr. O'Brien described the work which was going on for the purpose of improving our methods.

Dr. J. GRAHAM FORBES (London) described the progress which is being made in London and throughout the provinces in immunising the children at welfare centres and in the schools against diphtheria. Thirteen of the London boroughs have now provided such facilities, and some outside districts, such as Willesden and Tottenham. In addition to this, very satisfactory results had been obtained in many residential institutions and among the staffs of the M.A.B. hospitals. There was a considerable increase in this work during 1927 throughout the whole country.

Dr. B. A. I. PETERS (Bristol) described the very satisfactory results obtained in the immunisation of the hospital staffs of Bristol. They had found that the Schick test was not always reliable in the case of very virulent strains of diphtheria. They had now adopted for the hospital staffs immunisation without previous Schick testing. Their experience of immunisation against scarlet fever had also been satisfactory; he thought that all local authorities should adopt immunisation methods for their hospital staffs.

Dr. E. H. R. HARRIES (Birmingham) referred to the great value of surgical treatment of the nasopharynx in reducing the number of "return" cases of scarlet fever and diphtheria. The examination of throat swabs as a method of testing the fitness of diphtheria patients for discharge was now being given up. Although scarlet fever was usually mild in the case of children it was *not* always so in the case of probationer nurses, and it was well worth while to protect them by immunisation. He said it was high time that more facilities were provided for the education of medical students in the fever hospitals. They should act as clinical clerks for, say, a month, instead of the present spasmodic visits. "Return" cases of scarlet fever could best be prevented by immunisation of the contacts in the home. In order to secure the success of these new methods it was very necessary to have the full coöperation of the general practitioners.

SECTION OF PUBLIC HEALTH.

THE TEACHING OF HYGIENE.

In opening this discussion, over which Dr. R. M. F. PICKEN (Cardiff) presided, Prof. W. W. JAMESON (London School of Hygiene) limited his remarks to the teaching of preventive medicine to medical students, and to the training of other members of the health services. General practitioners being in the first rank of health workers every effort must be made to arouse the preventive outlook among medical students. In this teaching mere sanitary engineering need not fill a large place; lectures for medical students should not be regarded as lectures by experts for the use of experts. Although the syllabus was much too wide at present it failed to deal with the sociological aspect. In the training of sanitary inspectors he attached great importance to experience as craftsmen in one of the building trades. There was a danger that such craftsmen might be kept out by the demand for too high a standard of general education. He thought there should be more than one port of entry for health visitors, although he valued highly the training of a nurse. These should be probationary, and the salaries of health visitors proper should equal those of teachers in elementary schools. In the training of midwives a distinction should be made between those who intend to practise and those who are going to take up other health work. The principal midwifery schools should be reserved for the former, who should also have district training. For the latter a minor qualification, which might be termed "obstetric nurse," would suffice. Nurses who underwent training in a fever hospital were in an unsatisfactory position. If general hospitals accepted them subsequently they were treated as if their fever training had been of no account. Every trained nurse should have some fever training, and one year of her training might be devoted to this purpose. Health education in the schools should be carried out by teachers of the right type, and not by doctors or school medical officers. The teachers needed to be taught hygiene on more attractive and practical lines than at present. Many local authorities had not taken any interest in health education. He referred with approval to a syllabus drawn up by Dr. Brackenbury in 1904, when chairman of the Hornsey Education Committee, which, with minor alterations, had been in use ever since. Finally, they must get the general practitioner to take an interest in the education of the public. As regards broadcasting, he would prefer four-minute broadcasts on matters of special health interest at the particular moment, to the present 15 minutes health talks.

Dr. H. B. BRACKENBURY (chairman of B.M.A. Council) expressed himself in agreement with Dr. Jameson. The General Medical Council, he pointed out, has no direct power over the teaching bodies, but it can prescribe curricula and inspect examinations. It was impossible to coördinate the work of existing voluntary health education bodies, 100 in number. He thought that schools and general practitioners should be the most effective instruments of education. By educating the children they re-educated the parents. Education in sexual matters should only be given to older girls by head teachers or specially qualified teachers; it had been successfully done on these lines in Hornsey. There had hitherto been no attempt to deal with these questions in secondary schools. The question of mental hygiene had been neglected, and teachers needed instruction how to deal with mentally unstable and irritable children. He had not much faith in the benefits likely to accrue from public lectures or from the lectures of insurance practitioners to their patients. He would put first in importance the schools, second the day by day advice given by practitioners, and third the work of the health visitors in the homes.

Dr. D. LLEWELYN WILLIAMS (Welsh Board of Health) believed that the panel doctors had done much good since 1913, and were in a position to do good research into the beginnings of disease. They must secure a preventive outlook all through the medical curriculum. Birmingham had instituted lectures by panel doctors to their own patients, for which the insurance committee paid full fees. The results were claimed to be good.

Dr. BRACKENBURY intervened to say that the Representative Body was doing its best to encourage education by practitioners. A new household magazine was about to appear, and the Council of the Association had accepted the responsibility of supplying one page on health matters. The articles would be unsigned.

Dr. OLIVE WHEELER (Professor of Education, Cardiff) emphasised the importance of close coöperation between medical and educational bodies. For the teaching of hygiene in the secondary schools qualified biologists were needed; at present there were more females than males taking up biology among those trained. Some of the biological teaching must be practical—e.g., gardening. For the primary schools the teaching of hygiene is not living and imaginative enough; nature study should be correlated with hygiene and health practice. In their four years' course for teachers the fourth year was given up to the application of biology and other sciences. They also studied psychology and such questions as fatigue and development from a biological point of view. Practical teaching in physical exercises and the playing of healthy games was important. They had in Cardiff a "College adviser of games," who worked in close touch with the medical officer of health. It was too late to begin at the age of 5, and therefore nursery schools were needed for the teaching of habits.

Prof. HAROLD KERR (Newcastle-on-Tyne) thought much could be done to make the course of lectures in hygiene for medical students more interesting. He showed what a large amount of field work was included in the course given at Newcastle, and claimed that as a result the students who subsequently practised in the neighbourhood were his best supporters.

Mr. JAMES MACKENZIE (Secretary, Industrial Health Education Society) described how his society was getting in touch with workers in all occupations, and arranging medical lectures to such workers. The workers chose the subject, the medical officer of health helped to find the right lecturer, and "heckling" was encouraged. The workers were anxious for information about the many occupations inimical to health and life. In spite of huge expenditure on sick and medical benefits not a penny was spent on education under the Insurance Act.

Dr. ERNEST JONES (M.O.H., Cardiganshire) agreed that the teaching of hygiene had failed because the teachers had no knowledge of the sciences on which it was founded. Health knowledge would be a better name for the subject. He described the methods of teaching biology and physiology and their application to the students at Aberystwyth College. His suggestion that the clergy would benefit by a course of biology aroused applause. There was too much psychology and too little biology; they needed more science and less classics.

Mr. CREW (Sec., Central Health Education Council) favoured education by panel doctors. Ordinary public lectures did not reach the right people, and his society's experience of lectures by panel doctors was not very good. His society arranged successful medical lectures in the schools, and for the explanation of health films.

Mr. H. S. BOMPAS (Sec., Dental Board Health Campaigns) described what the Board did in the matter of organising dental lectures and supplying first-class apparatus free of charge. He found that local authorities sometimes had good schemes only on paper, and that teachers and health visitors knew the requirements of the district best. Some education committees had little enthusiasm. The Dental Board's films had been shown all over Northern Ireland, but they were not allowed in Scotland.

Prof. F. E. WYNNE pointed out that the public health lecturer could not choose the subjects which he thought best because he had to fit his students for an examination conducted by other examiners.

Dr. A. G. ROBB (Belfast Fever Hospitals) thought every nurse should spend some portion of her training in a fever hospital.

Dr. CARSTAIRS DOUGLAS (Anderson College, Glasgow) agreed that sanitary engineering figured too largely in the public health course.

Dr. C. F. L. LEIPOLDT (Cape Town) pointed out that there was no teaching with regard to the normal child in the medical curriculum, and that the qualified medical man had to learn by experience in the schools.

Dr. LETITIA FAIRFIELD urged that teaching should be practical, and Mrs. NEVILLE ROLFE drew attention to the failure to supply health education for the three million adolescents of the country.

SECTION OF THERAPEUTICS.

TREATMENT OF GASTRIC DISEASES.

Dr. A. F. HURST (New Lodge Clinic) opened a discussion on recent advances in treatment, remarking that he was himself unwilling to diagnose gastric or duodenal ulcer without direct X ray evidence, or to diagnose cancer of the stomach without evidence of occult blood in the stools. The fractional test-meal had also led to far more precise diagnosis. Dealing with the treatment of gastric ulcer, he said that the first factor to be dealt with was the acid factor, and this must be combated by diet and by such drugs as belladonna and alkalis. The second factor was that of focal sepsis; he doubted whether any ulcer could occur without such a factor. He stressed the importance of sinus infection and residual infection in the jaws of edentulous patients, to be found only by careful radiography. The other factors of importance were tobacco, worry, and fatigue. The latter factors necessitated treatment in bed. He showed by charts the effect of small feeds at frequent intervals in preventing the appearance of free HCl even when no alkali was given. Repeated X ray examination and search of the stools for occult blood were of value in demonstrating the progress of treatment. As regards after-treatment, he stressed the importance of an ulcer diathesis. Recurrences were usually due to a return to faulty habits, which must be prevented. Recent work had shown that bismuth salts were ineffective as alkalis whereas sodium citrate had high anti-acid powers; it was valuable in that its use involved no risk of alkalosis. Tribasic magnesium or calcium phosphate was also of great value and preferable to sodium bicarbonate and magnesium hydroxide. In conclusion Dr. Hurst spoke of the value of gastric lavage in pyloric obstruction; cicatricial obstruction was rare and would not result if the cases with spasmodic obstruction were rapidly treated. In chronic gastritis, associated with achlorhydria and excess of mucus, great improvement followed gastric lavage with hydrogen peroxide solutions.

Dr. T. IZOD BENNETT (London) said that it was perhaps difficult to speak of recent advances in the treatment of peptic ulcer at a time when the treatment adopted by many of the physicians chiefly interested in this subject had not yet been accepted by the professional in general, although such treatment had been successfully in vogue for ten years or more and had not been greatly modified during that period. He found that surgeons were inclined to condemn physicians merely because they were not magicians; the physician did not expect to cure except by the logical application of certain scientific principles over a period of time which must in some cases be somewhat lengthy. The essentials for successful treatment were, said Dr. Bennett, as follows:—

1. The removal of all sources of focal sepsis.
2. Prolonged and efficient arrest and neutralisation of gastric hyperacidity.
3. The reduction of peristaltic movements in the stomach and duodenum by an appropriate diet given at suitable intervals and so prescribed that the diet itself would exert a neutralising or adsorbing effect on acid.
4. The maintenance of active treatment during a period sufficient to secure permanent healing.
5. Prophylactic treatment aiming at the prevention of relapses.

All of these essentials were important and many of them were missing or insufficiently emphasised in treatments devised prior to that of the late Dr. Bertram Sippy. From a different point of view few of the treatments recommended were exactly on the lines of Sippy's because diets had to be devised to meet the requirements of patients of different nationalities. Prof. W. C. Alvarez, of Rochester, recently stated he had never seen a patient seeking relief for peptic ulcer who had, in his opinion, been efficiently treated prior to his first consultation with him, and it was a fact to-day, said Dr. Bennett, that the vast majority of patients coming under observation had never had treatment in which it could be claimed that the essentials outlined above had been carried out. Alkali is frequently given and almost invariably in insufficient dosage. Patients are treated for weeks and often undergo severe operations without important sources of oral sepsis ever being removed. It is an easy matter to relieve the pain for a patient with gastric or duodenal ulcer, in most cases by restricted diet and the administration of alkali, but unless such treatment is carefully planned and carried out for months after all symptoms have finished, relapse is almost sure to follow. In his opinion patients should be seen in consultation at regular intervals of three months or six months for a long time after they are apparently restored to full health, and at such consultations care should be taken to see that oral sepsis has been removed, that food likely to promote excessive peristalsis or hypersecretion is being avoided, and that large meals are never taken, reliance being placed on intermediate feeds to secure adequate nutrition. Proper attention to these points led to successful results.

Dr. J. H. ANDERSON (Ruthin) stressed the importance of coöperation with the patient. Three months was the minimum time for strict treatment; the first month should be in an institution; the second month as convalescence, and during the third a gradual return to work could be begun. After-treatment should go on for at least two years under supervision and consultation with his own doctor. The appendix was an additional source of infection and should be removed if necessary, but after-treatment should again be in the hands of a physician. Regarding diet he advocated a graduated diet beginning with olive oil and egg and milk at two-hourly intervals, boiled rice and pounded chicken being gradually added. By the twentieth day dry toast, steamed fish, custards, and milk puddings are given. At the end of the month a light bland diet with olive oil between meals is given. The rate at which the diet can be increased varies in individual cases and must be determined according to progress. Of alkalis he supported the use of magnesia salts, although the subject of the most suitable alkali was still being examined. He agreed with Dr. Izod Bennett as to the necessity of time to secure firm healing.

Dr. P. HAMILL (London) stressed the necessity of impressing on the patient the fact that his cure lay in his own hands. He felt that elaborate systems were bad because of the difficulty of applying them at home. He agreed with Dr. Hurst as to the value of sodium citrate. Ten grains of magnesium oxide would neutralise 10 oz. of gastric juice as secreted, 10 g. of magnesium carbonate or chalk, on the other hand, would only neutralise 4 oz., and bismuth was almost without effect. Citrates were valuable for avoiding the clotting of milk. The value of atropine in preventing spasm was to be remembered. It was remarkable how readily patients with gastric ulcer tolerated olive oil. A most important adjuvant to treatment was the use of blood transfusion in cases which had had severe hæmorrhage. Duodenal feeding was sometimes of great value in cases where obstinate pain and vomiting prevented adequate nutrition under oral administration.

Dr. A. P. CAWADIAS (London) emphasised the fact that focal infection was but one of many factors, amongst which constitutional factors in the endocrine system were equally important. He thought protein shock therapy was very valuable in alleviating pain and hastening healing.

The President, Dr. W. LANGDON BROWN (London), summing up the discussion, said that he felt the stomach was often more sinned against than sinning, being an organ essentially resistant to disease. He felt, however, that gastric ulcer was a disease which had become commoner without obvious cause. Rectal feeding had rightly fallen into disrepute. He felt that the Lenhartz diet had been a great advance in its day, but modern treatment recognised the importance of the individual patient's requirements. The importance of hydrochloric acid as a germicide was being more fully recognised, and the administration of this acid in cases of achlorhydria was of great importance. He praised the work of Gibson and others in putting on a firmer basis our knowledge of the alkalis of real value. The pendulum was swinging against the tendency to operate hastily. Hæmorrhage was no longer an indication for operation before adequate medical treatment had been tried. He concluded by refuting the doctrine enunciated at the Cancer Conference that all ulcers should be excised on account of the risk of malignant change. The evidence was that gastric cancer almost invariably arose in cases where there was no sign of any previous disease of the stomach, and the public were already sufficiently alarmed about cancer without the introduction of such a bogy.

Dr. HURST, in reply, emphasised the importance of chronic gastritis as revealed by fractional gastric analysis. He briefly reviewed the results of surgical treatment of gastric ulcer; the mortality of gastrectomy in a famous hospital was 15 per cent.; the mortality of medical treatment was nil and there were practically no cases which could not be cured medically if proper care was given to them.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 11TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 114 (last week 111); scarlet fever, 1322; diphtheria, 813; enteric fever, 174; pneumonia, 592; puerperal fever, 45; puerperal pyrexia, 99; cerebro-spinal fever, 5; acute poliomyelitis, 14; acute polio-encephalitis, 1; encephalitis lethargica, 20; continued fever, 1; dysentery, 22; ophthalmia neonatorum, 132. No case of cholera, plague, or typhus fever was notified during the week.

The following counties each notified three or more cases of enteric fever:—London, 40; Devon, 6; Essex, 28 (of these 22 from Colchester); Kent, 9; Lancaster, 13; Middlesex, 7; Norfolk, 4; Southampton, 7; Surrey, 11; Warwick, 3; Yorks, West Riding, 5; City of York, 5. The total of 174 includes 85 cases of paratyphoid fever, of which 37 were notified in London and 6 in Surrey.

The number of patients in the Infectious Hospitals of the Metropolitan Asylums Board on August 21st–22nd was as follows:—Small-pox under treatment, 12; scarlet fever, 1542; diphtheria, 1553; enteric fever, 120; measles, 169; whooping-cough, 216; puerperal fever, 15 (plus 7 babies); encephalitis lethargica, 71; poliomyelitis, 2; "other diseases," 16. At St. Margaret's Hospital there were 19 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 7 (5) from enteric fever, 12 (1) from measles, 2 (0) from scarlet fever, 23 (4) from whooping-cough, 23 (6) from diphtheria, 72 (18) from diarrhœa and enteritis under two years, and 27 (5) from influenza. The figures in parentheses are those for London itself. The monthly statement of deaths from small-pox contains the information that no such death was returned for the month of July.

The fatal cases of enteric fever outside London were reported from Leyton and Rochdale. Of the 19 fatal cases of whooping-cough outside London 6 were reported from Birmingham while Glasgow reported the same number that week. Of deaths from diarrhœa Liverpool reported 11; no other town in England and Wales outside London more than 4, but Glasgow 7 and Dublin 8.

The number of stillbirths registered during the week was 299 in the great towns (corresponding to a rate of 40 per 1000 births), including 48 in London.

A REVOLVING OPEN-AIR HOUSE.—The West London Hospital at Hammersmith has been presented with a revolving open-air house which has been placed on the flat roof of one of the wings. It has been the practice to place convalescent children on the roof in settled weather, but the revolving house now enables them to take shelter in the event of rain. The house will hold from seven to ten children.

Special Articles.

VITAL STATISTICS OF ENGLAND AND WALES.

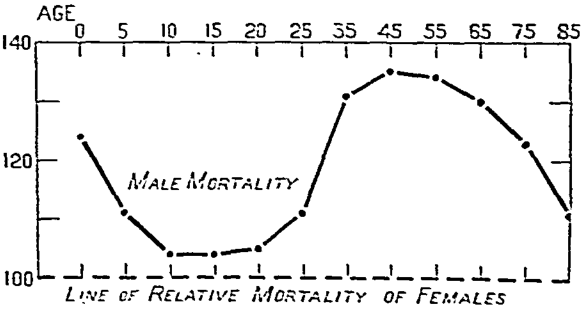
THE REGISTRAR-GENERAL'S REVIEW OF 1926.

THIS third of the volumes[1] in which the General Register Office now presents its annual statistical review is one which is, or at least ought to be, eagerly looked for by all medical officers of health and others interested in the incidence of disease. In fact, we fear it is read by few, and there can be no question that the public health service is the poorer by this default. The health officer who has studied this annual volume has increased his competence for his routine work year by year; he has had suggested to him problems for research which he can pursue; and his faith is fortified in the belief that for the pursuit of such researches there is not needed that knowledge of higher mathematical methods, fear concerning which has restrained timorous persons from inquiries of real public value. The present volume is perhaps the most interesting of a series of valuable medical reports which appear year by year; we can only hope to touch on a few points illustrative of the further riches waiting for extraction from a rich storehouse.

Progressive Ageing.

The progressive ageing of the English population is a phenomenon which it is difficult always to remember, although it has momentous bearing on our present and prospective vital history. The fact that the female death-rate in England and Wales last year was only 10 per 1000 illustrates the importance of remembering that the steadily falling birth-rate is now meaning a relatively small proportion of children under 5, and will before long mean a larger proportion of persons over 55, whose death-rate is higher than that at intermediate ages. It is very easy to fall into the error that such a death-rate means an average duration of life for each person of 100 years. In truth, it only means a duration of about 59·6 years, owing to the facts just mentioned. Hence the necessity for the standardised death-rates used throughout this report, in which adjustments are made for these excesses of persons at certain ages, as compared with an arbitrary standard population.

FIG. 1.



LINE OF RELATIVE MORTALITY OF FEMALES
at each age in 1926.

Much interest attaches to the death-rates in the two sexes at different ages. In Fig. 1 these are shown graphically in relation to each other. Let the straight be the death-rate at such successive age-period for females. Then the upper curve gives the corresponding male death-rate. The curve of the male death-rate is profoundly interesting. At ages 0–5 the male is 24 per cent. in excess of the female death-rate, an early female superiority of which no full explanation has been made. Between 10 and 25 the male inferiority is only some 4 or 5 per cent.; but at ages 45–55 the male death-rate is some 35 per cent. in excess of that of women. As old age approaches so do the death-rates for the two sexes come nearer together.

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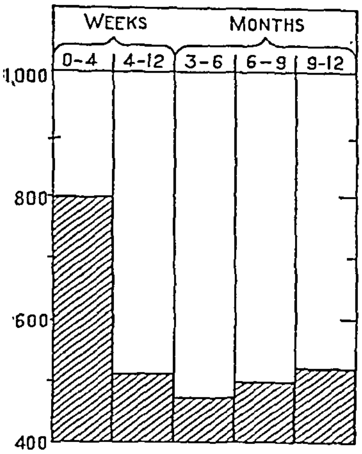
[1] The Registrar-General's Review of England and Wales, 1926. Text. 5s.

Infant Mortality.

The whole question of infant mortality is dealt with exhaustively, and the student will find here data bearing on every phase of this multiform problem. We can only draw attention to one point. This relates to the constantly reiterated statement that practically no progress has been made in securing a reduced death-rate during the first four weeks after live birth. The real facts are shown in Fig. 2. Comparing the average experience of 1906–10 with that of 1926, it will be seen that at this earlier period of "irreducible" mortality a reduction of over 20 per cent. has been experienced; while at the four subsequent divisions of the first year of life shown in the diagram a reduction of from 47 to 52 per cent. has occurred. It cannot be said that a 20 per cent. improvement is negligible; and with increased care of pregnancy, of childbirth, and of the lying-in period there is ample room for further improvement in this mortality of early infancy—in many parts of the country at all events.

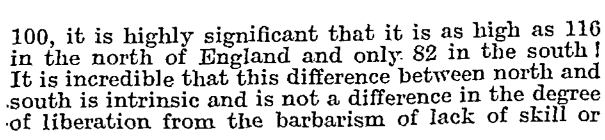
FIG. 2.



Relative infant mortality in 1926 as compared with that in 1906–10 taken as 1000 for five consecutive age-periods in infancy.

That this is so is further illustrated by Table X. on p. 12 of the Review. If the death-rate in the first month of life for England and Wales be stated as 100, it is highly significant that it is as high as 116 in the north of England and only 82 in the south! It is incredible that this difference between north and south is intrinsic and is not a difference in the degree of liberation from the barbarism of lack of skill or care.

FIG. 3.



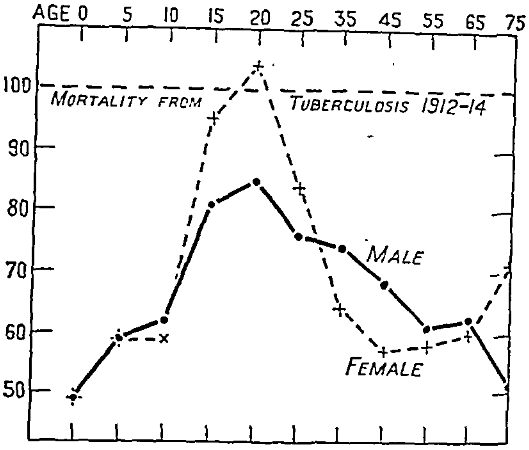
Total Death-rates North and South.

That this latter explanation holds is confirmed by the experience of north and south as regards total death-rate from all causes at successive periods of life. Fig. 3 shows the percentage excess of the northern areas of England over the average for England as a whole in the year 1926. This excess, which as shown in previous reviews, is not limited to industrial towns, calls for painstaking health inquiries in each northern community. The diagram contrasts the north with the whole of England. Evidently if north were contrasted with south the contrast would be even greater.

Tuberculosis.

The whole of this section of the Review should be studied by tuberculosis officers and others. The amount of improvement in the registered death-rate from total tuberculosis, when so recent a period as 1912–14 is compared with 1926, is shown in Fig. 4. Even after allowance has been made for the fact that the decrease of tuberculosis at ages 0–5 may be exaggerated owing to changes in nomenclature, the reduction shown at most ages is most striking. It will be noted that actual death-rates for each age-period are not shown in this diagram, but the percentage difference of the death-rate (male or female) in each age-period from that of 1912–14. For males it is seen that reduction has been experienced at all ages, and that even at the age-period 15–20 this decrease is 19 per cent., while at the age-period 20–25 it is 15 per cent. The smaller decrease at these ages than at other ages indicates a continuance of inimical influences which remain to be studied and removed. The course of the female relative death-rate brings out this point even more strikingly. At ages 15–20 the reduction in the tuberculosis death-rate is only 5 per cent. and at ages 20–25 it has actually increased by 4 per cent. It is impossible to avoid connecting this increase of the female death-rate in early adult life with the increasing migration into towns and the assumption of industrial and commercial in lieu of domestic life.

FIG. 4.

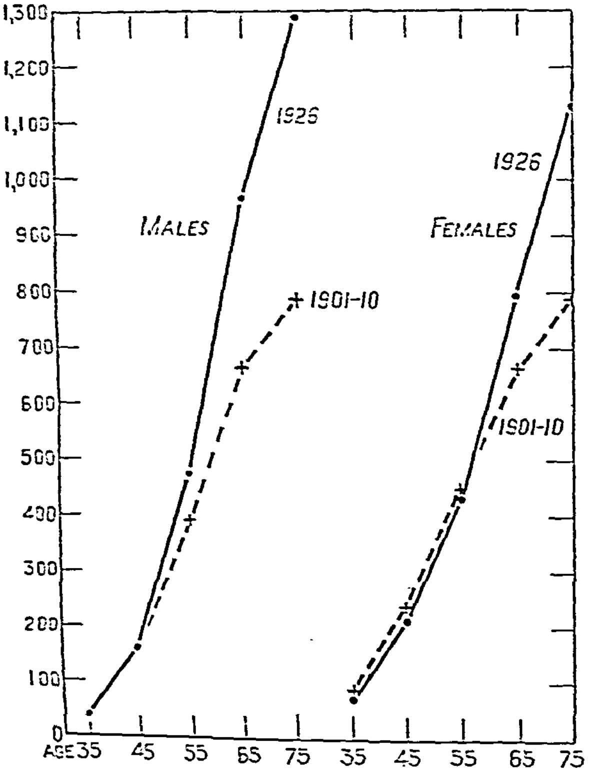


Relative death-rate from total tuberculosis in 1926 for each sex and all age-periods compared with the corresponding rate for 1912–14 taken as 100.

Cancer.

The section of the Review dealing with malignant disease is so important as almost to call for a special article. Doubtless this section of the report will be more eagerly scanned than any other, and it may be hoped that it will serve to temper and curtail the rash statements on the statistics of cancer which recur with monotonous inaccuracy. In view of the exaggerated statements as to increase of cancer Fig. 5 is very instructive. It is drawn from Table XLIII. on p. 64 of the Review. The age-distributed cancer death-rate at successive decades of life from 35 onwards for 1901–10 is compared with that of 1926, for males and females separately. Earlier ages are ignored, as the cancer death-rate is almost negligible prior to age 35. In both males and females an increased death-rate is shown, but this is practically limited to ages over 55 and does not become serious until the age of 65 is reached. This shows in the first instance the folly of writing about crude death-rates from cancer and the need for so-called standardisation. When this is done the registered increase at all ages in male cancer between 1901–10 and 1926 is 30 per cent.; according to the crude death-rate it is 71 per cent. One must remain in some doubt as to the extent to which the increase in cancer at the higher ages is real, and the extent to which it is due to increased accuracy in diagnosis and especially to the greater frequency with which skilled autopsies are now made. In this connexion it may be noted that registered cancer mortality is highest in the denser centres of population, and as pointed out in the Review, the excess in urban centres is much greater for males than for females. It is well-known that the proportion of inaccessible growths, liable to escape recognition as cancer, is much higher for the male sex.

FIG. 5.



Death-rates per million at each age-period 35–45 to 75 and upwards from cancer in the two sexes, 1901–10 being compared with 1926.

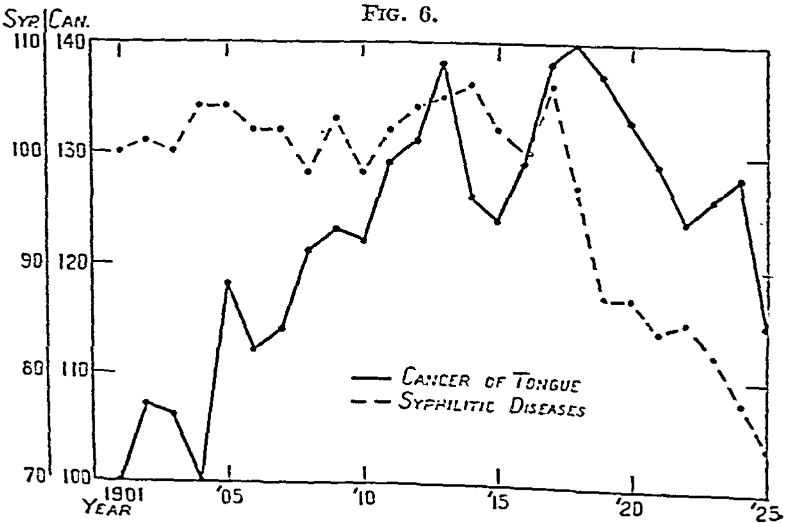
A noteworthy fact is that since 1913 there has been a practical absence of recorded increase of cancer for females, there being no increase of mortality from accessible growths and a comparatively slight rise for cancers in females of inaccessible sites. An important statement on p. 68 of the Registrar-General's Review is based on a revision of a former comparison made between cancer in accessible (easily diagnosable) and inaccessible parts of the body. In a preceding review such a comparison showed definite increase in accessible cancers, a result supporting the view of continuing increase in the death-rate from cancer. More recent returns, however, show that "for both sexes alike, there is no longer any evidence afforded by the comparison of accessible and inaccessible sites in favour of the reality of the recorded increase."

The interpretation of this result, which fits with observations made many years ago on the statistics of Frankfort-on-Main by King and Newsholme, is of course doubtful. It may mean that any apparent increase in inaccessible cancer is due to improved diagnosis; or, as pointed out in the Review, the facts are capable of an explanation of a totally different character. It may be that surgery has secured for the community a stationary position in the death-rate from "accessible" cancers which otherwise would have displayed a death-rate increasing like that of "inaccessible" cancers. Who shall decide? This opens up the great question as to the extent to which death certificates can be trusted to state the localisation of the primary growth when death occurs from cancer. For instance, if several years after a successful operation for cancer of the tongue or mamma (i.e., successful in the sense of no recurrence in the same site) a patient dies of cancer of the liver or some other internal organ, in what proportion of such cases is the primary site of cancer stated in the death certificate? It is hoped that this is usually done, as it ought to be always; but is this view consistent with probabilities; and if not, what is the unknown margin of error? On the individual answer to this question must depend the weight attaching to consideration of death statistics for cancer of various sites. We regard as extremely important the statistics of localised cancer published in the Registrar-General's Review, and trust they will be continued, for every year they will tend to approximate more closely to the natural history of each certified death from cancer. Notwithstanding the inevitable doubt expressed above, Table XLV. on p. 69 of the Review is intensely interesting. In the table of death-rates from cancer we give an incomplete summary of its larger items.

Death-rates from Cancer per Million Living.

Site of disease.	Males.	Females.
Lip, tongue, jaw	105	15
Pharynx and œsophagus	79	18
Stomach and liver	283	223
Intestinal (not rectum)	132	135
Rectum and anus	107	60
Uterus, ovary, vulva	—	206
Breast	2	184
All sites	1010	994

FIG. 6.



Relative (not actual) death-rates from cancer of the tongue and syphilitic diseases, the death-rate for each of these in the year 1900 being taken as 100.

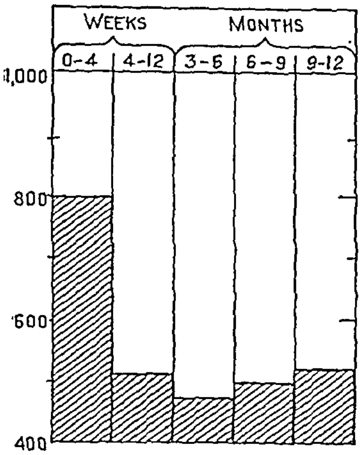
The table, and still more the fuller table from which it has been extracted, is pregnant with suggestions.

early female superiority of which no full explanation has been made. Between 10 and 25 the male inferiority is only some 4 or 5 per cent.; but at ages 45–55 the male death-rate is some 35 per cent. in excess of that of women. As old age approaches so do the death-rates for the two sexes come nearer together.

Infant Mortality.

The whole question of infant mortality is dealt with exhaustively, and the student will find here data bearing on every phase of this multiform problem. We can only draw attention to one point. This relates to the constantly reiterated statement that practically no progress has been made in securing a reduced death-rate during the first four weeks after live birth. The real facts are shown in Fig. 2. Comparing the average experience of 1906–10 with that of 1926, it will be seen that at this earlier period of "irreducible" mortality a reduction of over 20 per cent. has been experienced; while at the four subsequent divisions of the first year of life shown in the diagram a reduction of from 47 to 52 per cent. has occurred. It cannot be said that a 20 per cent. improvement is negligible; and with increased care of pregnancy, of childbirth, and of the lying-in period there is ample room for further improvement in this mortality of early infancy—in many parts of the country at all events.

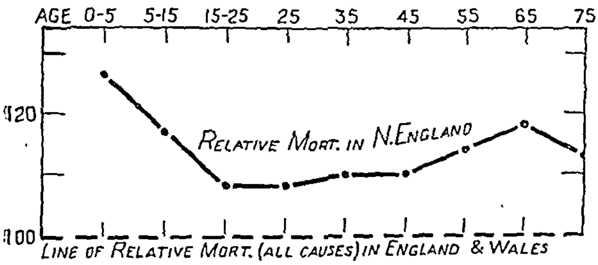
FIG. 2.



Relative infant mortality in 1926 as compared with that in 1906–10 taken as 1000 for five consecutive age-periods in infancy.

That this is so is further illustrated by Table X. on p. 12 of the Review. If the death-rate in the first month of life for England and Wales be stated as 100, it is highly significant that it is as high as 116 in the north of England and only 82 in the south! It is incredible that this difference between north and south is intrinsic and is not a difference in the degree of liberation from the barbarism of lack of skill or care.

FIG. 3.



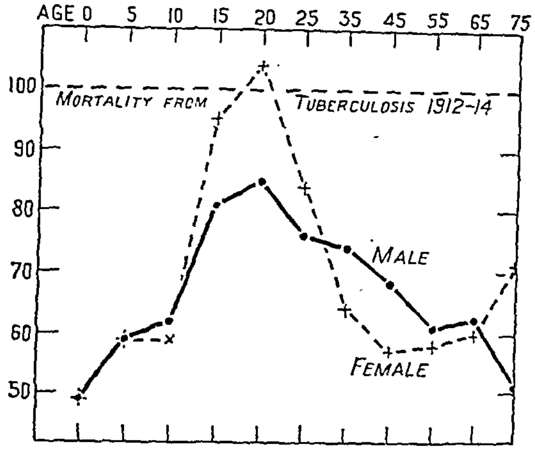
Total Death-rates North and South.

That this latter explanation holds is confirmed by the experience of north and south as regards total death-rate from all causes at successive periods of life. Fig. 3 shows the percentage excess of the northern areas of England over the average for England as a whole in the year 1926. This excess, which as shown in previous reviews, is not limited to industrial towns, calls for painstaking health inquiries in each northern community. The diagram contrasts the north with the whole of England. Evidently if north were contrasted with south the contrast would be even greater.

Tuberculosis.

The whole of this section of the Review should be studied by tuberculosis officers and others. The amount of improvement in the registered death-rate from total tuberculosis, when so recent a period as 1912–14 is compared with 1926, is shown in Fig. 4. Even after allowance has been made for the fact that the decrease of tuberculosis at ages 0–5 may be exaggerated owing to changes in nomenclature, the reduction shown at most ages is most striking. It will be noted that actual death-rates for each age-period are not shown in this diagram, but the percentage difference of the death-rate (male or female) in each age-period from that of 1912–14. For males it is seen that reduction has been experienced at all ages, and that even at the age-period 15–20 this decrease is 19 per cent., while at the age-period 20–25 it is 15 per cent. The smaller decrease at these ages than at other ages indicates a continuance of inimical influences which remain to be studied and removed. The course of the female relative death-rate brings out this point even more strikingly. At ages 15–20 the reduction in the tuberculosis death-rate is only 5 per cent. and at ages 20–25 it has actually increased by 4 per cent. It is impossible to avoid connecting this increase of the female death-rate in early adult life with the increasing migration into towns and the assumption of industrial and commercial in lieu of domestic life.

FIG. 4.



Relative death-rate from total tuberculosis in 1926 for each sex and all age-periods compared with the corresponding rate for 1912–14 taken as 100.

Cancer.

The section of the Review dealing with malignant disease is so important as almost to call for a special article. Doubtless this section of the report will be more eagerly scanned than any other, and it may be hoped that it will serve to temper and curtail the rash statements on the statistics of cancer which recur with monotonous inaccuracy. In view of the exaggerated statements as to increase of cancer Fig. 5 is very instructive. It is drawn from Table XLIII. on p. 64 of the Review. The age-distributed cancer death-rate at successive decades of life from 35 onwards for 1901–10 is compared with that of 1926, for males and females separately. Earlier ages are ignored, as the cancer death-rate is almost negligible prior to age 35. In both males and females an increased death-rate is shown, but this is practically limited to ages over 55 and does not become serious until the age of 65 is reached. This shows in the first instance the folly of writing about crude death-rates from cancer and the need for so-called standardisation. When this is done the which subsoil water percolates. Preventive measures have hitherto failed owing to lack of a unified control in antimalarial operations.

Pasteur Institute at Kasauli.

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Preceding remarks have a bearing on a diagram on p. 72 of the Review displaying a most suggestive comparison between the course in recent years of mortality from cancer of the tongue and from syphilis. In Fig. 6 the course of the death-rate from cancer of the tongue and that for the death-rate from the diseases which collectively give a fair index of fatal syphilis in the community are compared. In each case we have reduced the death-rates to a relative amount, each death-rate being given in proportion to the initial item stated as 100. The earlier part of the cancer curve shows a rapid increase in the death-rate from cancer of the tongue without any evidence of relation to the syphilitic death-rate. This may or may not indicate increasing accuracy in certification of the original site of cancer, or it may or may not mean an actual increase of cancer of this site, or both. The second half of the two curves from 1914 onwards displays a suggestive parallelism, though the Review is most cautious in deprecating premature pronouncement on this point. The general course of the curves shows that with decreased syphilis has gone decreased cancer of the tongue (as certified in death-returns) and confirms the wide pathological impression that there is a causal relation between the injury produced by earlier syphilitic lesions and later cancerous changes. As pointed out in the Review, "decrease of syphilis is not the only influence making for decrease of lingual cancer known to have been operative during the last few years." Among other influences may be mentioned improved dental care.

The continuing increase in the death-rate recorded from cancer of the breast is intriguing. In 1901–10 it averaged 158, in 1911–20 it was 171, and in 1926 it had increased to 184 per million of population (standardised). But in the period under comparison operations on mammary cancer have become more drastic and complete, and the real increase in mammary cancer may be greater than the figures display, for two reasons: more patients completely recover than in the past, and if the interval between operation and recurrence in another part of the body has increased, there is a greater likelihood that the medical certifier omits the mamma in his death certificate. But, on the other hand, such omission of primary breast cancer when death is directly due to an internal cancer was even more likely in the earlier years of registration, as is clearly shown in the parallel case of the decline in mortality from cancer of the liver. Who shall decide? We are left with an increased sense of the necessary limitations of massed statistics of cause of death when one attempts refinements of localisation of disease.

THE RETIREMENT OF DR. E. C. THOMPSON.—The committee of management of Tyrone County Hospital has accepted, with regret, the resignation of Dr. Edward Charles Thompson, who was appointed surgeon to the hospital in March, 1875. He succeeded his father, who had held the appointment for 40 years, making a total, for father and son, of 93 years' service. Dr. Thompson, who early in life received the Albert Medal and the St. John's Medal for bravery in saving life on land, sat in Parliament as a Constitutional Nationalist for North Monaghan from 1900 to 1906. He was formerly President of the North of Ireland Branch of the British Medical Association.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

The Incidence of Leprosy.

KNOWLEDGE of the incidence of leprosy in India is dependent on the 1921 census figures which were collected by untrained enumerators and are avowedly inaccurate. These figures, while they give very little idea of the total number of lepers in India, are useful as indicating the relative incidence in different provinces and districts. With a view to the collection of more accurate information an experimental survey of selected areas was instituted which has brought to light such facts and figures as to carry conviction of the necessity of continuing it at least to the end of 1928. The survey was begun experimentally in the Manbhum district of Bihar and Orissa, the Manbazar and Raghunathpur *thanas* being surveyed. Then the Onda and Gangajalghati *thanas* of the Bankura district of Bengal were surveyed; thereafter three areas in the Sonthal Parganas, and the end of the year found the survey party in the Chin Hills of Burma. In the first three districts the incidence of leprosy was found to be between four and five times that given by the census figures, but it cannot be claimed that even this survey has revealed the total incidence. The important advance made in the treatment of leprosy is the adoption of potassium iodide, the effect of which has been known for a long time, although the reactions caused by ordinary doses in the best known types of leprosy had led to its being considered dangerous. Clinical and pathological study at the Calcutta School has led to a classification of certain types and phases of leprosy which benefit from iodide. The full significance of the survey may be seen in the report of the Indian Council of the British Empire Leprosy Relief Association, which has just appeared.

Street Watering and Disease.

A prominent public health authority has again drawn attention to the dangers associated with the indiscriminate use of unfiltered water for spraying the streets of Calcutta. The water that is used for spraying is drawn from the most polluted portion of the river; it is practically raw sewage. When the silt that is thrown on the streets along with the water is nearly dry, and before it is sterilised by the sun, it is scattered all over the city by the wind. The dust teems with microbes and is undoubtedly a potent cause of eye, throat, ear, and nose ailments in the city. It is also responsible for many cases of septic pneumonia. Until the unfiltered water-supply is stopped and only filtered water used Calcutta will remain a city in which respiratory complaints flourish.

Malaria Problem in Bombay City.

That malaria has become much more widely diffused in Bombay within the last 15 years is the keynote of a report presented recently by the Government malariologist to the Bombay Corporation. The disease is still prevalent to a serious extent in the southern part of the city, due chiefly to the presence of unprotected wells; but the most intense malaria at the present time is in the vicinity of the mills, more especially in the Worli section. In certain areas from 30 to 70 per cent. of the children examined have shown evidence of malarial infection. It is possible that there is more endemic malaria in Bombay at the present time than there was in 1911. Apart from its effect on the health of the population and on the infant mortality of the city, the disease is the cause of very heavy financial loss to the city. There is no natural malaria in Bombay, the chief reason being the absence of natural streams. The cause of its prevalence in the city is the presence of thousands of permanent breeding-places artificially produced by man, the most important of which are wells, cisterns, fountains, tanks, water used in building construction, leakages from reservoirs, water-pipes, and cellars into which subsoil water percolates. Preventive measures have hitherto failed owing to lack of a unified control in antimalarial operations.

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THE GERMAN SICKNESS INSURANCE SYSTEM.*

THIS volume, the latest addition to the valuable series of publications issued by the International Labour Office on the subject of national health insurance, fully maintains the high standard set by its predecessors. It is evidently the fruit of much study and reflection and should be found useful by those who in other countries are grappling with the various problems of sickness insurance. Hitherto the recent experience of compulsory insurance against sickness in the land of its origin has been almost inaccessible to English readers who do not read German, for the two leading books in English on the subject, Mr. Dawson's "*Social Insurance in Germany*" and Mr. Gibbon's "Medical Benefit in Germany and Denmark," were published in 1912, and much has happened to the German insurance system within the past 16 years. To English readers, therefore, this book makes an especially welcome appearance.

Compulsory insurance against sickness on a national scale in Germany dates from June, 1883, although the principle of compulsion had already been introduced in various parts of the Empire; in Prussia miners had been compulsorily insured since 1854. At first the national scheme applied only to persons employed in certain named occupations, but others were added from time to time, especially by the important Act of 1911, which brought agricultural labourers and domestic servants within the scheme. At the present time the number of insured persons is rather more than 20,000,000, or nearly one-third of the total population. In Germany, insurance is compulsory not only against sickness, but also against invalidity and old age, and against industrial accidents (workmen's compensation). Each of these three forms of insurance is administered by a separate body of organisations; sickness insurance by the sickness funds (*Krankenkassen*), which are self-governing associations of insured persons and contributing employers; invalidity and old age insurance by the local insurance authorities, which are bureaucratic institutions with some representation of insured persons and employers; and accident insurance, to which the employees do not contribute, by mutual associations of employers. Moreover, sickness insurance is not regulated by a single code as in this country; there is a separate body of law for wage-earners, and another for salaried employees, while miners are insured under special Acts which provide a single system of sickness, invalidity, and old age insurance. The whole subject is exceedingly complex and difficult to understand, and Dr. Goldmann and Dr. Grotjahn are to be congratulated on the very considerable measure of success they have achieved in explaining it to the general reader.

Tendencies of Sickness Insurance.

Compulsory sickness insurance appears everywhere to develop on certain broad lines, which may most profitably be studied in Germany, where insurance on a compulsory basis has existed longer than in other countries. First, the proportion of the total population coming under insurance tends continually to increase, partly by the inclusion of additional occupations, but chiefly by the extension of insurance benefits to the dependents of the insured persons. This extension has made great progress in Germany since the war, and it is now estimated that in addition to the 20 million insured persons there are nearly 19 million dependents for whom benefits are available under the sickness insurance system, the total number forming more than three-fifths of the whole population. Secondly, cash benefits have become relatively less important than benefits in kind—medical treatment, &c. Experience has shown that it is more economical to provide the treatment necessary to restore working capacity than to provide the disabled worker with money to use at his own discretion. Consequently, the range of treatment provided by the sickness funds has greatly increased. Thirdly, a rapidly increasing activity is being displayed in the field of prevention.

Range of Treatment.

Treatment is given on a scale that is surprising to the English reader. The insured person in Germany is not only entitled to the services of a general practitioner, as in this country, but he has also provided for him the whole range of modern therapeutic measures—specialist services, including electro-physical, balneological, and orthopædic treatment, and treatment and maintenance in sanatoriums and other residential institutions. Treatment may be given by arrangement between the sickness fund and outside institutions, but in many cases the funds make direct provision in their own institutions. The General Local Sickness Fund of Hamburg has four institutes for artificial sunlight therapy and a large orthopædic institute for making appliances, where in 1925 there were made 5424 trusses, 16,305 flat-foot supports, 3352 abdominal belts, and nearly 18,000 other articles. In 1924 no less than 19,906 X ray examinations were made in the institute of the Association of Berlin Sickness Funds, and 13,715 in the Institute of the Dresden Local Sickness Fund. Diagnostic facilities are provided on a large scale. The Institute of the Association of the Berlin Sickness Funds contains chemical, pathological, bacteriological, and serological departments, and makes between 5000 and 6000 examinations monthly. In 1924 it was consulted by about 3000 insurance doctors in Berlin. In-patient hospital treatment is usually provided by arrangement with institutions established by the communes or voluntary organisations, but some funds have established hospitals of their own; the miners' funds have 21 hospitals with 3970 beds.

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Preventive Work of the Sickness Funds.

In recent years there has been a remarkable development of the preventive side of sickness insurance. For instance, special attention is given to maternity and child welfare. The statutory maternity benefits, which are provided for both insured and their dependents, include (1) attendance by a midwife, and, if necessary, medical attendance; (2) a lump sum payment of M.10; (3) a weekly payment during the four weeks preceding and the six weeks following confinement; and (4) an additional weekly cash payment during 12 weeks after confinement to those mothers who nurse their babies. The funds contribute to the communal maternity and child welfare centres, and some have established centres of their own, which are widely consulted; the centre of the Erfurt Sickness Fund is consulted by nearly 80 per cent. of the mothers of the area. Dr. Goldmann and Dr. Grotjahn think that the effort put forth in this direction is still inadequate, but there seems no doubt that an enormous amount of good work is being done. The funds participate in welfare work among school-children, they contribute towards the provision of country homes, forest schools, open-air baths, games, &c. Some funds maintain their own country institutions; the Sonneberg Fund has its own forest school, where the children have facilities for sun baths, swimming, gymnastics, &c. Contributions are made towards school meals; in 1925 the Cologne Funds contributed 45 per cent. of the cost of the meals provided by the municipality for school-children. Many funds provide orthopædic gymnastics for the children of the members.

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In the antituberculosis campaign the lead, so far as the insurance organisations are concerned, has been taken by the invalidity insurance institutions, but the sickness funds are now taking an active part in the work. The facilities they afford for free medical examination, with various kinds of specialist assistance, tend to the early detection of the disease, and the sick visitors of the funds encourage the members to seek medical advice when disease is suspected. The funds contribute largely to the maintenance of sanatoriums and dispensaries and some have established institutions of their own. What is regarded as an important health measure, especially in this connexion, is the provision of convalescent treatment and recuperation in country convalescent and holiday homes, forest camps, &c., particularly for young workers newly exposed to the stress of economic employment. The funds participate in the anti-alcohol and antivenereal movements, and a system of compulsory notification of venereal disease, with supervision of the patients, has been instituted by a number of the funds. Much health propaganda is carried out by such means as the distribution of pamphlets and periodicals, the organisation of lectures, health exhibitions, films, plays, &c. The Central Union of German Sickness Funds publishes a monthly health journal which has a circulation of nearly half a million. The first German "Health Week" was organised jointly in 1925 by the municipality of Berlin and the sickness funds, and this was followed in 1926 by a "National Health Week" largely owing to the efforts of the funds.

The Sickness Funds and the Medical Profession.

The extensive range of the medical services provided by the sickness funds brings them into close relation with the great body of the medical profession in Germany. It is estimated that about 30,000 doctors, or 80 per cent. of the whole profession, work for the funds, and that for the great majority this work forms the chief source of their income. Dr. Goldmann and Dr. Grotjahn estimate that more than half of all incomes from medical practices in Germany is derived from sickness insurance. The system of employment of doctors and the methods and amount of remuneration differ widely amongst the various funds, but the system of free choice of doctor, which is one of the basic demands of the profession, appears to be making headway. Before 1923 the funds were practically autonomous in making arrangements with the doctors, but in that year provisions were introduced into the Federal Insurance Code to regulate the doctors' contracts, so that certain conditions of service are common to the whole country. The funds, however, still possess a considerable measure of autonomy.

Some Criticisms of the German System.

The German sickness insurance system is a wonderful achievement in the field of social reform, but as the authors of this volume do not hesitate to point out, it is by no means free from defects. The work of the funds appears to be imperfectly coördinated with the health work of other agencies and there is much overlapping and duplication of effort, which could be avoided by improvements in organisation. Again, the system has not succeeded in attaining the vitally important object of securing harmonious relations between the administrative bodies and the medical profession, and our authors think that no real improvement may be expected until something like the British system is adopted under which the local arrangements with the doctors are made by an insurance committee on which the local medical profession is represented.

The utility of this volume to the foreign reader would have been enhanced if the authors had included a preliminary account of the general framework of the German social insurance system, explaining the organisation of the different agencies concerned in the various forms of insurance, their relation to each other and to the local authorities and the State. Certain technical terms—e.g., "basic wage"—might usefully have been defined and explained and the statistics brought to a later date than 1925, when for the most part they end. And the medical reader would have welcomed fuller information on the subject of the relation of the funds to the doctors, the nature of the problems that have arisen in that connexion, and the progress that is being made towards their solution. These, however, are but minor criticisms of an important work of sterling value and utility.

MEDICINE AND THE LAW.

Dangerous Drugs Legislation.

THE *London Gazette* of August 17th gave notice that the Dangerous Drugs Act of 1925 will come into force on Sept. 25th, 1928, that being the date when the International Opium Covention signed at Geneva in February, 1925, begins to operate. The notification will recall to our readers the abrupt termination of the proceedings against Colonel Kynaston, when counsel for the Crown admitted in the Court of Criminal Appeal that the Act of 1925 (cited, possibly unnecessarily, in the framing of the charges in that case) was not yet operative. The proceedings consequently resembled, as the Lord Chief Justice remarked, the pulling of a bell-rope when there was no bell at the other end. The Geneva Convention of 1925 provided (by Article 8) that, if the Health Committee of the League of Nations, after having submitted the question for advice and report to the Permanent Committee of the Office International d'Hygiène Publique in Paris, found that any preparation containing any of the narcotics referred to in Chapter III. of the Convention—i.e., drugs to which Part III. of our Dangerous Drugs Act, 1920, as amended, applies—could not give rise to the drug habit on account of the medicaments with which those narcotics are compounded and which in practice preclude the recovery of the said drugs, then the Health Committee should communicate the finding to the parties to the Convention and thereupon the provisions of the Convention should not apply to the preparation concerned. Our 1925 Act was passed to give effect to the Geneva Convention. The resultant changes in our dangerous drugs legislation are these: Part I. of our Dangerous Drugs Act of 1920 (regulating dealings in raw opium and restricting its import and export) is extended to coca leaves, Indian hemp, and resins obtained from Indian hemp, and all preparations of which such resins form the base. "Coca leaves" and "Indian hemp" are specially defined. Section 2 of the 1920 Act enacted that nobody should export raw opium from the United Kingdom except under licence and from approved ports, *and except in packages marked in the prescribed manner with an indication of the contents thereof*. The italicised words now cease to have effect. The 1925 Act also substitutes a new definition of the drugs to which Part III. of the 1920 Act applies, and a new definition of "medicinal opium." Finally, it authorises the making of Orders in Council excluding preparations from Part III. of the 1920 Act where there has been a finding under Article 8 of the Geneva Convention as already described.

whereas in the neighbouring State of Idaho the case-mortality has been no higher than 5 per cent. During the last few months, however, the use of a serum has been definitely effective in cutting down the death-rate.

THE GERMAN SICKNESS INSURANCE SYSTEM.*

THIS volume, the latest addition to the valuable series of publications issued by the International Labour Office on the subject of national health insurance, fully maintains the high standard set by its predecessors. It is evidently the fruit of much study and reflection and should be found useful by those who in other countries are grappling with the various problems of sickness insurance. Hitherto the recent experience of compulsory insurance against sickness in the land of its origin has been almost inaccessible to English readers who do not read German, for the two leading books in English on the subject, Mr. Dawson's "Social Insurance in Germany" and Mr. Gibbon's "Medical Benefit in Germany and Denmark," were published in 1912, and much has happened to the German insurance system within the past 16 years. To English readers, therefore, this book makes an especially welcome appearance.

Compulsory insurance against sickness on a national scale in Germany dates from June, 1883, although the principle of compulsion had already been introduced in various parts of the Empire; in Prussia miners had been compulsorily insured since 1854. At first the national scheme applied only to persons employed in certain named occupations, but others were added from time to time, especially by the important Act of 1911, which brought agricultural labourers and domestic servants within the scheme. At the present time the number of insured persons is rather more than 20,000,000, or nearly one-third of the total population. In Germany, insurance is compulsory not only against sickness, but also against invalidity and old age, and against industrial accidents (workmen's compensation). Each of these three forms of insurance is administered by a separate body of organisations; sickness insurance by the sickness funds (*Krankenkassen*), which are self-governing associations of insured persons and contributing employers; invalidity and old age insurance by the local insurance authorities, which are bureaucratic institutions with some representation of insured persons and employers; and accident insurance, to which the employees do not contribute, by mutual associations of employers. Moreover, sickness insurance is not regulated by a single code as in this country; there is a separate body of law for wage-earners, and another for salaried employees, while miners are insured under special Acts which provide a single system of sickness, invalidity, and old age insurance. The whole subject is exceedingly complex and difficult to understand, and Dr. Goldmann and Dr. Grotjahn are to be congratulated on the very considerable measure of success they have achieved in explaining it to the general reader.

Tendencies of Sickness Insurance.

Compulsory sickness insurance appears everywhere to develop on certain broad lines, which may most profitably be studied in Germany, where insurance on a compulsory basis has existed longer than in other countries. First, the proportion of the total population coming under insurance tends continually to increase, partly by the inclusion of additional occupations, but chiefly by the extension of insurance benefits to the dependents of the insured persons. This extension has made great progress in Germany since the war, and it is now estimated that in addition to the 20 million insured persons there are nearly 19 million dependents for whom benefits are available under the sickness insurance system, the total number forming more than three-fifths of the whole population. Secondly, cash benefits have become relatively less important than benefits in kind—medical treatment, &c. Experience has shown that it is more economical to provide the treatment necessary to restore working capacity than to provide the disabled worker with money to use at his own discretion. Consequently, the range of treatment provided by the sickness funds has greatly increased. Thirdly, a rapidly increasing activity is being displayed in the field of prevention.

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In recent years there has been a remarkable development of the preventive side of sickness insurance. For instance, special attention is given to maternity and child welfare. The statutory maternity benefits, which are provided for both insured and their dependents, include (1) attendance by a midwife, and, if necessary, medical attendance; (2) a lump sum payment of M.10; (3) a weekly payment during the four weeks preceding and the six weeks following confinement; and (4) an additional weekly cash payment during 12 weeks after confinement to those mothers who nurse their babies. The funds contribute to the communal maternity and child welfare centres, and some have established centres of their own, which are widely consulted; the centre of the Erfurt Sickness Fund is consulted by nearly 80 per cent. of the mothers of the area. Dr. Goldmann and Dr. Grotjahn think that the effort put forth in this direction is still inadequate, but there seems no doubt that an enormous amount of good work is being descendants never will produce diphtheria toxin, there is no means, so far as I know, of distinguishing them from other races similar in all respects except that their recent ancestors were known to have been toxigenic—i.e., to have possessed a different antigenic make up. As the word indicates, antigenic characters in a parasite imply reactions in the host and hence are of paramount importance in medicine. In spite of this fact, it is debatable if antigenic qualities are in general sufficiently stable for differentiation of "species," however useful they may be in describing subspecies, types, races, varieties, and special strains within the species.

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I am, Sir, yours faithfully,
SHELDON F. DUDLEY.

Royal Naval College, Greenwich, S.E., August 11th, 1928.

PAPWORTH COLONY AND SANATORIUM TREATMENT.

To the Editor of THE LANCET.

SIR,—Several daily papers represented at the recent Dublin Congress have been devoting leading articles to the above; and, so far as they help Dr. Varrier-Jones's cause, they will do nothing but good. Unfortunately, however, they give the impression that sanatorium treatment has been a failure, a statement which is at most a half-truth, and much to be deplored.

The immediate results of sanatorium treatment are surprisingly good; favourable cases are restored to health, and many unfavourable ones are much improved. In the most favourable, the good results are permanent; but, unfortunately, four-fifths of those applying for treatment have already passed the most favourable stage, or for other reasons are not likely to make a complete recovery, whatever the treatment. In such cases the results of sanatorium treatment are conditional, and relapses happen if the quarters are unsatisfactory, the conditions of life are unhealthy, or the rules learnt in the sanatorium forgotten or ignored. To blame the methods of treatment because the after-conditions are not satisfied is not logical. One of these after-conditions is the possibility of earning an adequate wage under healthy conditions. Another is to permit of rest in the open-air if symptoms arise which call for it. It is a great merit of Dr. Varrier-Jones's arrangements at Papworth that these three essentials are provided. His methods are not a substitute for sanatorium methods (for there is no substitute), but they are a valuable extension. Many of his inmates have had some treatment in a sanatorium; and any of them receives a similar treatment in the colony whenever he needs it.

From the earliest days of sanatorium propaganda it was clearly stated that the sanatorium is only one link—though an essential one—in the chain of treatment. So long as the fear of infection prevents the sanatorium patient from obtaining remunerative employment under suitable conditions, the need for colonies like Papworth, or for special workshops as advocated by the late Dr. F. S. Tinker, will be urgent; but they are not, and cannot be, a substitute for the sanatorium, which combines advantages in the same way as a hospital for other ailments.

I am, Sir, yours faithfully,
F. R. WALTERS.

Farnham, Surrey, August 25th, 1928.

THE LATER RESULTS OF PARTIAL GASTRECTOMY FOR GASTRIC AND DUODENAL ULCER.

To the Editor of THE LANCET.

SIR,—A study of the figures relating to chronic gastric and duodenal ulcer given by Mr. Norman Lake in his paper on the "Later Results of Partial Gastrectomy" in THE LANCET of August 11th shows that (1) gastro-enterostomy was *unsatisfactory in 36 per cent.* of 61 cases, but there was no mortality; (2) partial gastrectomy was unsatisfactory in only 2·5 per cent. of 51 cases, but there was a *mortality of 9 per cent.* (5 out of 56), which is greater than the risk of malignant degeneration.

These are the "later" results, but experience shows that the "last" results—i.e., after an interval of ten years or more instead of five years or less, would give a much greater number of unsatisfactory results, especially in view of the fact that Mr. Lake allows his patients to eat whatever they like. In the German and American clinics, in which partial gastrectomy has been the routine surgical treatment of ulcer for ten years, so many anastomotic ulcers have followed the operations recommended by Mr. Lake that nothing less than excision of four-fifths of the stomach is now performed. This would presumably have a still higher mortality, and we shall have to wait another ten years before we know how often it is followed by jejunal ulcer. Then I expect complete gastrectomy will become the operation of choice, for nothing short of this will produce achylia, as Klein has shown that when the secretion of appetite juice is stimulated by tasting or seeing food, but nothing is swallowed, free acid appears in the small portion of the stomach still remaining after subtotal gastrectomy.

It is clear that, *if* Mr. Lake's results can be taken as typical: (1) gastro-enterostomy is unjustifiable except for pyloric obstruction because of the 36 per cent. unsatisfactory results; and (2) partial gastrectomy is unjustifiable because of the high mortality.

An interesting commentary on Mr. Lake's paper is the fact that since 1921 we have had at New Lodge Clinic 37 patients suffering from gastric ulcer, 165 from duodenal ulcer, and no less than 67 from the ill-results of gastro-enterostomy or partial gastrectomy, performed in most instances for ulcer. Our experience shows that gastro-enterostomy is the commonest gastric disorder to-day, and undoing gastro-enterostomies is the gastric operation we now most frequently recommend. I am, Sir, yours faithfully,
ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, August 15th, 1928.

To the Editor of THE LANCET.

SIR,—I have read with interest Mr. Lake's paper published in your issue of August 11th; there is a good deal in it, however, which does not coincide with my own experience. An extensive inquiry into the after-results of a short-circuiting operation for duodenal ulcer show that these are at least as good as those following any surgical procedure in the abdomen. I am not concerned here with the respective merits of gastro-duodenostomy and gastro-jejunostomy; and for the sake of convenience will hereafter refer to both as gastro-enterostomy.

I am sure that surgeons who are constantly and fully carrying out the technique involved in the operation of gastro-enterostomy will regard Mr. Lake's figure of 36 per cent. unsatisfactory results as much too high. Indeed, such a figure is undoubtedly a very strong reason for seeking some other operative procedure. In my experience the unsatisfactory results are not more than 10 per cent., and in many of these the symptoms are so slight and evanescent that the cases should be included under Mr. Lake's heading of "satisfactory." Again, it is not clear on reading this paper how many gastrectomies were done for duodenal ulcer and how

Another notification in the same *Gazette* announces that Part III. of the Act of 1920 is henceforth to apply to benzoyl-morphine, dihydro-oxycodeinone, dihydrocodeinone, and their respective salts, and to any preparation, admixture, and extract containing benzoyl-morphine, dihydro-oxycodeinone, and dihydrocodeinone. This Order in Council is made under Section 8 Subsection (2) of the 1920 Act, whereby His Majesty may apply Part III. to any drug whatever, if it appears that such drug is or is likely to be productive, if improperly used, of ill-effects substantially like those produced by morphine or cocaine.

TUBERCULOSIS IN IRELAND.

(FROM OUR OWN CORRESPONDENT.)

SOME of the communications made to the Congress of the Royal Institute of Public Health held recently in Dublin give interesting information on the subject of tuberculosis in the Irish Free State. Sir William Thompson, formerly Registrar-General of Ireland, showed slides exhibiting the death-rates from tuberculosis in England and Wales, Scotland, and Ireland from 1904 to 1926. The rate for England and Wales had decreased from 1·75 per 1000 living in 1904 to 0·95 in 1926; for Scotland from 2·25 to 1·00; and in Ireland from 2·85 to 1·45. In 1912 tuberculosis came first on the list of causes of death in Ireland with 9400 deaths; in 1926 it came fourth with a little under 7200 deaths. It was generally agreed, Sir William added, that there were eight people suffering from tuberculosis for each death, and one might conclude, therefore, that there were some 16,000 fewer people suffering from tuberculosis than in 1912. Somewhat different figures were given by Mr. E. P. McCarron, Secretary of the Department of Local Government and Public Health. Contrasting the years 1912 and 1927, he found that in the area now comprised in the Irish Free State the number of deaths from tuberculosis in 1912 exceeded those in 1927 by 2600. If both writers are correct then there would appear to be a slight increase in the number of deaths in the area of Northern Ireland. Mr. McCarron added that in respect of the operation during last year of 19 of the approved tuberculosis schemes in the Irish Free State, 1536 tuberculous patients were made fit to resume their ordinary life. He gave these figures as an illustration of the value of wise expenditure in the preservation of the public health. "The blunderer with an axe at public expenditure was a menace to all that was best in our civilisation."

Mr. J. H. Norris, Director of Veterinary Research, Department of Lands and Agriculture, Irish Free State, gave valuable information as to the extent of tuberculosis among cattle in the Irish Free State. There were, he said, no complete or even extensive statistics bearing on the incidence of tuberculosis in dairy cattle in the Irish Free State, but from results of tuberculin tests carried out in various herds it might be assumed that at least 20 per cent. were tuberculous. This evidence was supported by separate statistics kept at the Dublin abattoir. During 1926 23·69 per cent. of cows slaughtered were found to be tuberculous, but of these only 3·17 per cent. showed lesions extensive enough to call for total destruction of the carcass. Only 6·52 of bullocks and 5·59 of heifers were found affected. For some time past mixed samples of milk from herds in various parts of the country had been examined at the Department of Agriculture's veterinary laboratory. Up to June 30th last 391 samples from different herds, containing 3884 cows, or an average of 10 cows in each herd, had been dealt with. All samples, in addition to microscopic examination, were submitted to the biological test, with the result that 18, or 4·60 per cent., were found to contain tubercle bacilli. Positive cases were followed up and dealt with under the Tuberculosis Order.

Correspondence.

"Audi alteram partem."

SMOOTH AND ROUGH VARIANTS OF BACTERIA.

To the Editor of THE LANCET.

SIR,—On the whole I concur in Dr. Arkwright's criticisms, in THE LANCET of August 11th, of my letter in the previous number. Especially would I support him in the quest for biological generalisations, without which clear thinking becomes impossible. I therefore deeply regret my letter conveyed any impression to the contrary. Moreover, the exceptions to such "laws" are of prime importance since they often furnish a clue to the relationships between bacterial races. Doubtless, also, it would lead to less confusion had the terms "rough" and "smooth" been reserved for the contrasted antigenic and other characters as originally described by Dr. Arkwright. Unfortunately, smooth and rough are everyday words, which so aptly point the antithesis between two widely distributed types of colony appearance and consistence that it is difficult to resist using them for this purpose. The strains of parasites termed *C. diphtheriæ* in my letter, were, in the vast majority of cases, isolated from separate hosts, or the same host at different times; only a few strains were derived from a common parent strain during their laboratory existence. Surgeon-Commander Parker only describes the laboratory side of the investigations referred to. The work was an attempt to find out what variations took place in certain "non-specific" characters of a group of bacteria all of which had enough "specific" characters to satisfy my concept of *C. diphtheriæ*. The results indicated that during their existence in their natural habitat, the human throat, this group varied widely in composition at different times and places. As Dr. Arkwright truly points out, any value this work may have depends on the meaning given to *C. diphtheriæ*. Perhaps a brief attempt to explain what I do mean may to a slight extent indicate the relationship between the species-concept and variation as applied to bacteria. I believe it to be unwise at the present time to define too rigidly any bacterial species. As a working hypothesis an organism must have certain stable and definite criteria before it is assigned to a "conventional type species." As facts accumulate it may be found advisable to add or subtract criteria from these which determine the "type species," in order to exclude or include certain strains of bacteria. For example, in the Greenwich investigations a bacterium had to possess the following attributes before it was diagnosed as *C. diphtheriæ*. The organism must ferment glucose but not saccharose, grow aerobically on congulated serum without liquefying it, and form non-chromogenic colonies. Smears from cultures of suitable age on solid serum had to show Gram-positive, Neisser-positive, pleomorphic *bacilli*. It is evident, from Dr. Arkwright's letter, that although I *feel* that the above definition is the most practicable to work round, yet he *feels* some reference to toxin production is essential in order to identify an organism with *C. diphtheriæ*—i.e., should a culture of an organism, otherwise qualified for inclusion in the species, produce no diphtheria toxin, it must be known that its ancestors were toxigenic before it can be named *C. diphtheriæ*. It may be taken as now definitely established that many toxigenic races of *C. diphtheriæ* are able to throw off avirulent variants. Before this was generally accepted, many bacteriologists considered that *all* avirulent bacilli were species distinct from virulent diphtheria bacilli. Such an opinion is no longer tenable, and even if there should be "pure lines" of bacilli, possessing the criteria given above, whose ancestors never have and whose descendants never will produce diphtheria toxin, there is no means, so far as I know, of distinguishing them from other races similar in all respects except that their recent ancestors were known to have been toxigenic—i.e., to have possessed a different antigenic make up. As the word indicates, antigenic characters in a parasite imply reactions in the host and hence are of paramount importance in medicine. In spite of this fact, it is debatable if antigenic qualities are in general sufficiently stable for differentiation of "species," however useful they may be in describing subspecies, types, races, varieties, and special strains within the species.

For these reasons I personally dislike including any reference to toxigenicity in the description of *C. diphtheriæ* as a "species"; but the subject is full of difficulties of which this correspondence is only able to give a hint. However, Dr. Arkwright's letter illustrates clearly one point of practical importance—that, until there is a universally used standard bacterial nomenclature, where an author refers to a subdivision of the bacteria, he must take care that it is possible for others to understand exactly what he means. I plead guilty to not having done so in my previous letter.

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THE LATER RESULTS OF PARTIAL GASTRECTOMY FOR GASTRIC AND DUODENAL ULCER.

To the Editor of THE LANCET.

SIR,—A study of the figures relating to chronic gastric and duodenal ulcer given by Mr. Norman Lake in his paper on the "Later Results of Partial Gastrectomy" in THE LANCET of August 11th shows that (1) gastro-enterostomy was *unsatisfactory in 36 per cent.* of 61 cases, but there was no mortality; (2) partial gastrectomy was unsatisfactory in only 2·5 per cent. of 51 cases, but there was a *mortality of 9 per cent.* (5 out of 56), which is greater than the risk of malignant degeneration.

These are the "later" results, but experience shows that the "last" results—i.e., after an interval of ten years or more instead of five years or less, would give a much greater number of unsatisfactory results, especially in view of the fact that Mr. Lake allows his patients to eat whatever they like. In the German and American clinics, in which partial gastrectomy has been the routine surgical treatment of ulcer for ten years, so many anastomotic ulcers have followed the operations recommended by Mr. Lake that nothing less than excision of four-fifths of the stomach is now performed. This would presumably have a still higher mortality, and we shall have to wait another ten years before we know how often it is followed by jejunal ulcer. Then I expect complete gastrectomy will become the operation of choice, for nothing short of this will produce achylia, as Klein has shown that when the secretion of appetite juice is stimulated by tasting or seeing food, but nothing is swallowed, free acid appears in the small portion of the stomach still remaining after subtotal gastrectomy.

It is clear that, *if* Mr. Lake's results can be taken as typical: (1) gastro-enterostomy is unjustifiable except for pyloric obstruction because of the 36 per cent. unsatisfactory results; and (2) partial gastrectomy is unjustifiable because of the high mortality.

An interesting commentary on Mr. Lake's paper is the fact that since 1921 we have had at New Lodge Clinic 37 patients suffering from gastric ulcer, 165 from duodenal ulcer, and no less than 67 from the ill-results of gastro-enterostomy or partial gastrectomy, performed in most instances for ulcer. Our experience shows that gastro-enterostomy is the commonest gastric disorder to-day, and undoing gastro-enterostomies is the gastric operation we now most frequently recommend.

I am, Sir, yours faithfully,
ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, August 15th, 1928.

To the Editor of THE LANCET.

SIR,—I have read with interest Mr. Lake's paper published in your issue of August 11th; there is a good deal in it, however, which does not coincide with my own experience. An extensive inquiry into the after-results of a short-circuiting operation for duodenal ulcer show that these are at least as good as those following any surgical procedure in the abdomen. I am not concerned here with the respective merits of gastro-duodenostomy and gastro-jejunostomy; and for the sake of convenience will hereafter refer to both as gastro-enterostomy.

I am sure that surgeons who are constantly and fully carrying out the technique involved in the operation of gastro-enterostomy will regard Mr. Lake's figure of 36 per cent. unsatisfactory results as much too high. Indeed, such a figure is undoubtedly a very strong reason for seeking some other operative procedure. In my experience the unsatisfactory results are not more than 10 per cent., and in many of these the symptoms are so slight and evanescent that the cases should be included under Mr. Lake's heading of "satisfactory." Again, it is not clear on reading this paper how many gastrectomies were done for duodenal ulcer and how many for gastric ulcer. It is essential to differentiate, for in many respects the two diseases are very unlike. The type of patient is not the same, gastric ulcer makes the patient much more ill as a rule, and duodenal ulcer is virtually never the precursor of malignant disease. It is a debatable point as to how often carcinoma becomes grafted on to gastric ulcer, but I think most surgeons allow that it happens sufficiently often to cause the possibility of any such change to pass through their minds on most of the occasions on which they deal with a gastric ulcer. The difference between the two types of ulcer (or perhaps one should say the types of patient) has a vital bearing on the statistics of anastomotic ulcer following gastrectomy. I have seen three cases where such an ulcer had formed after partial gastrectomy had been done for jejunal ulcer in which gastro-enterostomy had been done previously for duodenal ulcer; I have Sir Berkeley Moynihan's permission to say that he has had 12 such cases sent to him, and that he has never seen an anastomotic ulcer develop after a primary gastrectomy for gastric ulcer. Mr. Lake's explanation, that too little of the stomach was removed (that is to say, not all of the acid secreting part) does not apply to these cases.

Because of the difficulty of dealing directly with ulcers on the posterior surface of the duodenum, eroding the pancreas and causing marked deformity, I should regard these as the ulcers to be treated by gastrectomy, if this operation were ever necessary for duodenal ulcer; but gastro-enterostomy is very successful in these cases and the mortality is less than 1 per cent. I venture to say that in a series of this type gastrectomy would show a very much bigger mortality, and I presume this is the kind of ulcer Mr. Pannett has in mind when he finds it necessary to insert in his book on gastro-duodenal ulceration some paragraphs dealing with injury to the bile and pancreatic ducts as a complication which is observed in a certain percentage of cases of resection.

It is a great mistake to think that having performed the operation of gastro-enterostomy the business is finished. It is essential to deal with the ulcer itself at the time, and to treat the patient medically for long afterwards. I would suggest that the failure to take these two points into consideration in compiling statistics goes far to explain the high figures of unsatisfactory results sometimes given. This does not condemn gastro-enterostomy, or show the necessity to substitute gastrectomy; it is a reflection on the vision of the surgeon, for after all there is, or may be, still an ulcer present, and the operation only goes part of the way in promoting the patient's complete recovery.

I think if Mr. Lake could show that gastro-enterostomy gave the high percentage of unsatisfactory results which he quotes, in spite of a full measure of complementary treatment before, at, and after the operation, he would convince his readers that there were sound grounds for advocating gastrectomy for duodenal ulcer—even though it is followed by a higher mortality, and carries with it the risk of anastomotic ulceration, a risk which may prove to be as great as that after gastro-enterostomy, if no more.—I am, Sir, yours faithfully,

E. R. FLINT, F.R.C.S. Eng.

Leeds, August 15th, 1928.

THE HEART AND CIRCULATION IN BERI-BERI.

To the Editor of THE LANCET.

SIR,—May I refer Dr. Sutherland to the *Dublin Journal of Medical Science* for October, 1916, in which I draw attention to the negative pressure existing in the pericardium of a healthy person, and its tendency to disappear from the pericardia of persons in ill-health, especially those with serous effusion in the large cavities. This negative pressure results in a suction action whereby the pericardial fluid is kept at an equal thickness all over the surface of the heart and acts as a support to the working organ. A removal of that support affects the weaker-walled right ventricle at an earlier stage than the left. I have suggested the formula $F=(P+I)\div(T+S)$ where F=fibrillation, P=pressure, I=impulses, T=tone, and S=support; *from* which it is easy to see that if tone or support or both be diminished the tendency to fibrillation is increased. In beri-beri effusion occurs into the serous cavities, the general feebleness of the circulation implies that tone is less, consequently heart failure sets in. Prof. Wenckebach suggests the existence of a law of circulatory correlation between the right and left heart, working along simple mechanical lines. Does my formula help him in his contention?

I am, Sir, yours faithfully,

G. ARBOUR STEPHENS,

Consulting Cardiologist, King Edward VII. Welsh National Memorial.

Swansea, August 18th, 1928.

THE VITAMIN A CONTENT OF COD-LIVER OILS.

To the Editor of THE LANCET.

SIR,—In your issue of June 30th (p. 1353) Prof. J. C. Drummond attempts to counter statements made in an article published in the *Anglo-Norwegian Trade Journal* for May, 1928, which is based upon information which I have given the editor of that journal. Drummond's reply does not touch upon the crux of the matter, and is therefore unsatisfactory. As previous articles regarding this matter have appeared some years ago, a short résumé is necessary.

1. In 1924 Prof. Drummond (University College, London), jointly with Dr. S. S. Zilva (the Lister Institute, London) and Dr. Graham (The Fisheries Laboratory, Lowestoft), published in the *Biochemical Journal* (1924, XVIII., 178) a paper entitled: The Relation of the Vitamin A Potency of the Liver Oil to the Sexual Condition and Age of the Cod. In this very searching work they particularly treated the question whether the spawning of the cod had any influence on the vitamin content of the oil. Repeatedly, and in a most definite way, it is stated in the article referred to that no such influence could be demonstrated. For example: regarding the results of the four series of tests of cod from Flamborough and Scarborough during the months of January to June, it is stated that "even the liver oils from spent cod in March fish, which must have spawned just before being caught, and which had no time to recuperate, did not deviate in potency from the oils of fish before spawning, and several months after spawning and consequently after recuperation." The paper ends up with the following summary: "The sexual condition and age of the cod do not influence the vitamin A potency of the liver oil." In 1924 I myself carried out similar investigations, and came to the same conclusion, but in view of the paper in the *Biochemical Journal*, I considered any publication of my findings superfluous.

2. In 1925 Prof. Drummond published in THE LANCET (Sept. 26th, p. 679) a paper in which, without producing any fresh data, he says, with regard to oils produced in the important fishing district of Lofoten (Norway), that during spawning the oil becomes poor in vitamins and contains only one-tenth to one-fifth of the vitamin potency of that of oil from other places (Finmarken and Newfoundland), where the fisheries do not take place during the spawning period. The reason apparently being that, when the fish "are practically starving during the spawning period, and are at the same time transferring much fat and vitamin to the reproductive cells, the livers yield an almost white oil of relatively low potency." This is exactly opposite to the findings of Prof. Drummond and his collaborators in 1924: about the fish in this condition it is here said that "the relative potency of the residual liver oil is, however, not effected."

Drummond's paper of 1925 has during these years served as the basis for an exceedingly intense advertising of Newfoundland cod-liver oil, at the expense of the Norwegian oil and at great economic loss to the latter.

3. It was not until several months later that I became aware of Drummond's article in THE LANCET of Sept. 26th, 1925, and I thereupon wrote a rejoinder which appeared in your issue of Feb. 6th, 1926 (p. 320). Therein I expressed surprise that the Prof. Drummond of 1925 should contradict the Prof. Drummond (and his colleagues) of 1924. My paper was couched in the most moderate terms. I sent a copy of it to Drummond, and although it appeared necessary that he should furnish some explanation, he sent me no answer.

4. On the other hand, a reply was made by Dr. Zilva, who had previously collaborated with Prof. Drummond. This reply is now made use of in such a way by Drummond in your issue of June 30th (p. 1353) that the reader who has not kept fully in touch with developments may get the impression that Zilva supported Drummond. I do not believe others will agree with this interpretation. Zilva's reply leaves nothing to be desired in the way of explicitness:

> "As I did not see Prof. Drummond's article until it appeared in print I do not hold myself responsible for everything stated therein. Prof. Poulsson is quite right in asserting that the sexual condition of the cod during spawning has no bearing upon the activity of the oil, as was shown by my colleagues and myself, and I feel gratified that this work has been confirmed by our Norwegian colleague."

Prof. Drummond must be in a most unhappy frame of mind when he accepts this severe correction without a word of protest.

It appeared inevitable that Prof. Drummond should at this juncture explain himself, but no such explanation has been made, not even in his last letter. Instead of explaining upon what basis in 1925 he denies results achieved by himself and his colleagues in 1924, he devotes a lot of space to treating other subjects not relevant to the present issue. For example, a comparison is made between the biological and colorimetric tests, obviously in order to get an opportunity to point out that my tests of certain samples of cod-liver oil had been carried out according to a defective method. In this connexion I will content myself with pointing out that these assays had partly been completed already in 1923; the improved and now applicable method was described by Steenbock in 1924.

Summarising the above, we find ourselves faced with an instance of an author contradicting himself and his colleagues without communicating with them (one of them subsequently denying responsibility), without producing new data, and without offering any explanation. A situation of this kind is unparalleled in scientific discussion, and the situation is by no means clarified by Drummond's last letter, except in so far as he has now abandoned the contention which formed the chief basis of his paper in THE LANCET of Sept. 26th, 1925—namely, that the sexual condition of the cod during the spawning period influences the vitamin content of the liver oil.

I am, Sir, yours faithfully,

Oslo. E. POULSSON.

INSTRUCTION IN PSYCHIATRY.

To the Editor of THE LANCET.

SIR,—I should like in the first place to thank you for the kindly notice of my book on "Mental Disorders" in your issue of July 21st. My object in writing to you now is to comment on Dr. Estelle Cole's letter in your issue of August 11th. I hope that your review will be approved not only by "many of the older school of psychiatry," but also by those of some at least of the newer schools who realise the inchoate condition of much of modern psychological teaching regarding, for example, the psychoneuroses. So long as such a short period of time is allotted in the medical curriculum for the teaching of psychiatry in general, it seems to me that it would be unwise to employ more than a modicum of it in dealing with contentious psychological matters. When there is something approaching a settled doctrine I shall be only too glad to set it forth for those students and others who may care to read what I write. In conclusion, I find myself in complete agreement with what you say in your note that "so important and difficult a subject should be properly taught or left alone." It seems to me that there is a good deal of modern pseudo-psychology—or pseudo-psychopathology—which is not properly taught, but which is improperly practised.

I am, Sir, yours faithfully,

Wimereux, August 20th, 1928. HUBERT J. NORMAN.

"FUSSING OVER CANCER."

To the Editor of THE LANCET.

SIR,—Your correspondent "D.P.H.," in the course of an excellent letter, remarks that it is really a truism to say that "the earlier cancer is detected the better are the patient's chances of recovery." Having made this uncontroversial statement, he goes on to ask: "Why is there a certain hesitancy . . . in launching educational campaigns with regard to cancer?" and the inference would seem to be that "cancer campaigns throughout the world" have neglected this very useful part of what should be one of their primary activities. In order to attempt to prevent this inference being accepted as the whole truth of the matter, may I be allowed to draw the attention of your readers to some of the educational work undertaken by the Yorkshire Council of the British Empire Cancer Campaign?

Shortly after the Yorkshire Council was created, our leader, Sir Berkeley Moynihan, recognising that the education of the public was of prime importance, proposed that a propaganda subcommittee should be formed and financed. This was done, and the funds placed at its disposal were considerable in amount and were mainly derived from donations given by Insurance and Panel committees in the County. This subcommittee has done a great deal of work. It has issued a very comprehensive little book entitled "Notes on Cancer," prepared under the direction of the Medical and Scientific Committee of the Yorkshire Council. Free copies of this book have been sent to all practitioners in the county and many have been sent, by request, to almost all parts of the Empire. Any practitioner requiring the book may have it on application to our Secretary, at 47, Park-square, Leeds. The subcommittee has organised several courses of post-graduate lectures to practitioners by eminent authorities, the list of lecturers including the names of such well-known men as Sir Berkeley Moynihan, Prof. G. E. Gask, Prof. Grey Turner, Dr. Major Greenwood, and Prof. Sampson Handley. Most of these lectures have been very largely attended, and there is a demand for further courses which the subcommittee hopes shortly to be able to meet.

Having, in the above ways, attempted to assist practitioners by placing before them the latest available information, the subcommittee directed its attention to an effort to educate the public. It first succeeded in obtaining the services of a competent woman doctor who was well fitted to place facts before individuals which it felt they ought to know. It then organised a series of public demonstrations, called—for want of a better name—"cancer exhibitions." Each exhibition visits a selected town and is open to the public for, usually, one week. Various statistics, showing the number of deaths arising from cancer in different parts of the body are exhibited in graphical form. Large quantities of leaflets are used and visitors urged to take them home and show them to their friends. Information on various questions of health is given. Lectures by medical men and women of standing are delivered, and each day a local doctor gives a short talk, emphasising the necessity for early advice and treatment in all cases where the disease may be suspected. The woman demonstrator has personal interviews with visitors throughout each day and the burthen of her story is: "If you have anything wrong—or if you *fear* you have anything wrong—don't go on anxiously worrying, but consult your doctor and ask him to examine you and advise." These exhibitions have been attended by marked success. Thousands of people have visited them, and excellent reports of the lectures and addresses have been given in the public press. They are not easy to organise, for the difficulty in making them attractive to the public, whilst at the same time excluding all "gruesome" details is a very real one. None the less the subcommittee is very satisfied with the results. The deplorable experience of Dr. Stanley Reimann, as given in "D.P.H.'s" letter, has not been ours! When our work began I think most lay people agreed that a diagnosis of cancer—no matter where situated or how early or late it had been recognised—was tantamount to a sentence of death. This is not so now. The facts that some 50,000 people die annually from cancer in England and Wales; that getting on for 20,000 of these cases originally arise from superficial—and therefore get-at-able areas; that an enormous percentage of early cases have been shown by fully confirmed hospital reports to be alive 10 years after treatment, constitute, when proclaimed, a "message of hope" which the public is not slow in appreciating. Evidence supplied by surgeons and general practitioners in our county convinces us of this.

The fears of "frightening people to death," of "creating a nation of neurasthenics," do not impress the members of our Council. Our leader's happy phrase—"frightening them to *life*"—appeals to us more strongly, and it is a long time since I read so excellently logical an exposure of the futility of commonly used objections as that given in the letter of "D.P.H."

I am, Sir, yours faithfully,
G. B. HILLMAN,
Chairman, Medical Propaganda Subcommittee, Yorkshire Council, British Empire Cancer Campaign.

Wakefield, August 18th, 1928.

OSTEOCLASTOMA.

To the Editor of THE LANCET.

SIR,—I should be much obliged if you will correct an error which appears in THE LANCET of July 28th (p. 183) in the report of the proceedings of the recent International Conference on Cancer. In the discussion on bone sarcoma I spoke in favour of the view that the so-called giant-celled tumour or myeloid sarcoma is derived from the fibrous-tissue framework of bone and that the giant cells are osteoclastic (not osteoblastic) in nature. Osteoclastoma (not osteoblastoma) was suggested as a better name for this tumour than any of those at present in use, combining, as it does, brevity with precision of meaning.

I am, Sir, yours faithfully,
M. J. STEWART.

Leeds, August 15th, 1928.

PAYMENT FOR MOTOR ACCIDENT PATIENTS.—The governors of Folkestone Royal Victoria Hospital last week adopted the following resolution: "In cases provisionally admitted by the resident medical officer or by the matron for immediate treatment which has become obligatory as the result of a motor accident, each patient admitted shall pay for treatment at the rate of 11*s.* 4*d.* per day, subject, however, to the committee deciding subsequently that these charges be increased, reduced, or remitted." The resolution was the result of correspondence with the Central Bureau of Hospital Information.

Obituary.

WILLIAM SMITH SYME, M.D. EDIN., F.R.F.P.S. GLASG.

Mr. Syme, who died suddenly on August 14th, when on a holiday in North Wales, was well known in Cumberland and south-west Scotland as a specialist and writer on diseases of the nose, throat, and ear. Born in Harbour Grace, Newfoundland, in 1870, he was at an early age sent to school at Blair Lodge and continued his medical studies at Edinburgh, where he qualified M.B., C.M. in 1891. He then went as assistant to Dr. Charles Wilson, of Crewe, before starting general practice himself at Gamlingay, Cambs, where he remained till 1902. He had always enjoyed the life of the country and at that time he joined in the field sports of all kinds, being captain of the cricket team for some years. His return to Scotland was actuated by the desire to develop the more scientific professional side of his work, and after attending the clinics of Dr. Thomas Barr at the Ear Hospital and Dr. J. W. Downie at the Western Infirmary, and working on the former's staff, he decided to specialise in ear, nose and throat work, and in 1904 began consulting work in this specialty in Carlisle, and some years later in Dumfries. In 1913 the course at the Western Medical School was recognised by the University; in 1917 Mr. Syme was appointed surgeon to the Ear, Nose and Throat Hospital, and three years later to the Nose and Throat Western Infirmary. In the same year he became lecturer on diseases of the throat, later adding appointments and a lectureship in ear surgery to his other duties.

MR. W. S. SYME.

Photo by Annan, Glasgow

Mr. Syme was one of the founders of the Scottish Otological and Laryngological Society, and for many years its hon. secretary and treasurer. He was a ready and accurate writer on clinical subjects, his most considerable literary work being a handbook for students and practitioners, published in 1920, of which a new edition has recently appeared. His aim in this book was especially to stimulate the interest of students in a subject likely to concern them very closely, immediately on entering general practice. His oral teaching will be missed by Glasgow students who found in him the embodiment of good-humoured energy, and one who always showed an active interest in athletics, while the nursing staff were pleasantly aware of the uniform kindness and courtesy with which he treated both patients and their relatives. His devotion to duty and the heavy claim of detailed professional work are regarded by his friends as contributory to his early death. Few men, it is said, held such a place in the esteem and affection of their colleagues.

Mr. Syme married in 1895 a daughter of Thomas Paisley, J.P., of Greysouthen, Cumberland, and is survived by his wife, two sons, and four daughters.

MARY LAUCHLINE McNEILL, M.B. GLASG.

NEWS has been received from Kamali, Africa, of the death of Dr. Mary McNeill, on June 10th, from typhoid fever at Jinga Hospital. Dr. McNeill was born in 1874 at Holm in the Orkney Islands, eldest daughter of the Rev. Daniel McNeill, M.D. She went to school at Fochabers, studied music and languages in Germany and Switzerland, and later became a medical student at Queen Margaret College, Glasgow, where she graduated in 1905. She then returned to Orkney and practised there until 1914, when she went to Leicester to relieve her brother for service with the R.A.M.C. In 1916 Dr. McNeill held the appointment of resident physician in the Leicester Fever-Hospital for several months until she joined the staff of the Scottish Women's Hospital in Salonika. She remained there until early in 1919, when she moved with the hospital to Belgrade. In the autumn of the same year she went to Tiberias in Palestine to the U.F. Medical Mission under Dr. Torrance, and thence to the Central Provinces, India, until 1921. After a short holiday at home she became a member of the Church of Rome and joined the Catholic African Mission, first at Kampala, Uganda; latterly she worked single-handed with three Franciscan Sisters at a remote station in Kamali. She was looking forward to coming home on leave in November.

Prof. A. L. McIlroy writes: "Those who knew Dr. Mary McNeill loved her for her upright character, her unselfish life, and her devotion to her family. Her mysticism and joy in living was a source of wonder to her friends. She took a great interest in literature and art, and had a most marked gift for writing and for poetry. She was a loyal colleague, and always upheld the administration of those under whom she worked. Dr. McNeill never lost her youthful interest in people and places. She had travelled extensively, had absorbed new ideas and made friends wherever she journeyed. Her passing has left a great gap in the hearts of her friends."

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee 50 applications for assistance were considered and £825 5*s.* voted to 45 cases. Consideration of the following notes on a few of the applicants helped will show how sad some of the cases are and how urgent is the need of help, yet unfortunately the grant was small. The Fund appeals for subscriptions to enable it to make more adequate grants. Subscriptions and donations should be sent to the hon. treasurer, 11, Chandos-street, Cavendish square, W. 1.

L.R.C.S. Edin., aged 74, married; wife aged 72. The husband is completely broken down in health and is quite unfit to do any kind of work. This old couple have a total income of £82 a year, made up of Old Age Pension £52 and Epsom Pension £30. As their rent is £26, there remains only £56 for food and clothes. Voted £40, thus raising their income to £122 a year.

M.D., aged 75, bedridden. Has no private means, but was able to earn a little last year from literary work. Voted £10.

Widow, aged 80, of M.D. Bedridden and suffers from cerebral and anginal attacks, requires nursing day and night. Her only income is £50 being rent from a property which she has been unable to sell. Her two children have done all in their power to help and have contributed £42 a year. Voted £40.

Widow, aged 73, of L.R.C.P. On the death of her husband in 1925 her house was sold and the proceeds went to pay off existing debts, leaving the widow only £370 as capital. She is in receipt of Old Age Pension. Her relations have given some financial assistance this year but cannot continue to do so. Voted £26.

Widow, aged 52, of M.B. Since the death of her husband has supported herself and her invalid son by taking in paying guests, but owing to ill-health (diabetes) has been unable to take guests during the last 12 months. Her son has a congenital heart with marked cyanosis. Income during past year was investments £7 10*s.* and from a paying guest £6. Voted £26. The Fund is trying to get other charities to assist in this very sad case.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates satisfied the examiners in the undermentioned subjects:—

Surgery.—J. P. Collinson, Sheffield and London Hosp.; H. B. Blaker, St. Mary's Hosp.; E. C. Gross, Guy's Hosp.; I. G. Hardinge, Charing Cross Hosp.; G. L. Johnson, Columbia Univ., U.S.A.; C. K. McCoan, St. Mary's Hosp.; and C. F. C. White, Guy's Hosp.

Medicine.—T. A. Barnabas, Bristol; C. M. Brooks, Durham; J. S. Bury, Manchester; A. E. Gibbs, London Hosp.; K. Girgis, Manchester and Charing Cross Hosp.; I. G. Hardinge, Charing Cross Hosp.; H. H. Jackson, Manchester and Charing Cross Hosp.; G. L. Johnson, Columbia Univ. U.S.A.; H. C. Johnson, Minnesota, U.S.A.; J. H. Johnston and G. L. McDermott, St. Bart.'s Hosp.; M. T. Y. Selim, Liverpool; and H. D. K. Wright, St. Bart.'s Hosp.

Forensic Medicine.—N. Das, London Hosp.; E. C. Gross, Guy's Hosp.; I. G. Hardinge, Charing Cross Hosp.; A. H. Hennessy, Adelaide and London Hosp.; G. L. Johnson, Columbia Univ., U.S.A.; H. C. Johnson and K. R. Lundeberg, Minnesota, U.S.A.; C. P. Madden, St. Bart.'s Hosp.; S. M. Rahman, Calcutta and Middlesex Hosp.; M. T. Y. Selim, Liverpool; and H. D. K. Wright, St. Bart.'s Hosp.

Midwifery.—C. M. Brooks, Durham; H. C. Clifford-Smith, Charing Cross Hosp.; W. A. A. Collington, Guy's Hosp.; J. P. Collinson, Sheffield and London Hosp.; F. W. Crossley-Holland, St. Bart.'s Hosp.; L. P. Gregory, Bristol; I. G. Hardinge, Charing Cross Hosp.; A. H. Hennessy, Adelaide and London Hosp.; G. L. Johnson, Columbia Univ., U.S.A.; H. C. Johnson and K. R. Lundeberg, Minnesota, U.S.A.; R. Perkins, St. Bart.'s Hosp.; and T. A. P. Proctor, Birmingham.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: H. B. Blaker, H. C. Clifford-Smith, J. P. Collinson, I. G. Hardinge, A. H. Hennessy, G. L. Johnson, G. L. McDermott, S. M. Rahman, M. T. Y. Selim, and H. D. K. Wright.

DERMATITIS AMONG BAKERS.—At the Eighteenth Annual Congress of the Amalgamated Union of Operative Bakers and Confectioners held at Cardiff on August 20th, attention was called by the general secretary of the union (Mr. W. Anfield) to the alarming spread of dermatitis among bakers throughout the country. He asserted that there is a conspiracy of silence on the part of men suffering from the disease and also on the part of their employers. He believed that for every one man reported to be suffering from this disease there were three others unreported. It was suggested that since 1918 and 1919 something had been introduced into the raw material used by bakers which had caused a greater spread of this disease, and that the sole sufferers are the operative bakers. A resolution was passed stating that the conference viewed with alarm the spread of dermatitis among members of the union, and urged the Executive Committee to spare no expense in the matter, and to call for the assistance of the Government department together with the Master Bakers' Association and the millers and the medical profession.

THE LONDON HOSPITAL.—In 1927 the annual report records there were 16,840 in-patients who stayed, on an average, 15–19 days and cost £11 3*s.* 6*d.* each. New out-patients to the number of 114,509 made 567.525 attendances at a cost of 12*s.* each. The total ordinary income increased from £234,088 to £263.546, while ordinary expenditure fell from £262,900 to £250.419. The year's legacies totalled £51,315, nearly double the average.

CONTRIBUTIONS TO HOSPITALS FROM DOCKERS.—More than 10,000 dockers have agreed in writing to contribute to the Merseyside Voluntary Hospitals Penny-in-the-Pound scheme.—During the year ended on June 30th last Devonport Dockyard and its allied establishments, by means of a similar scheme, raised £5136, making a total for the last five years of £20,891.

MANCHESTER GUARDIANS AND CANCER FUND.—The Manchester board of guardians at its meeting on August 22nd again discussed the guardians' contribution of £1000 to the Lancashire, Cheshire, and North Wales Council of the British Empire Cancer Campaign, as the result of a letter from the Minister of Health intimating his inability to sanction the contribution. It was stated that the Minister was "unable to regard so considerable a donation to a fund of this kind as being within the spirit and intention of Section 36 of the Poor-law Act, 1927." He was, however, prepared to consider favourably applications from the guardians to subscribe reasonable amounts to the funds of the hospitals undertaking the treatment of cancer, in which persons receiving relief from the guardians are having, or are to have, assistance in cases of necessity.

MATERNITY HOSPITAL FOR SOUTHPORT.—The Southport Health Committee has accepted the offer of Miss Christiana Hartley, a former mayor of the town, to build a new maternity hospital. The present building was a temporary soldiers' hospital and last year, out of 1000 births in Southport, 300 took place within it. The new institution will be adjacent to the infirmary and will correspond, in design and material, with its main block.

THE LATE DR. S. W. GRIFFITH.—Samuel Wilbraham Griffith, of the Hermitage, Pwllheli, died suddenly on August 24th, aged 72. He began his medical studies in Dublin and continued them in Edinburgh, where he qualified L.R.C.P. and L.R.C.S. in 1884. He was one of the best-known medical practitioners in North Wales, a J.P. of Carnarvonshire, and senior magistrate of the shire, having officiated in the Pwllheli Court for nearly 40 years.

ROYAL WESTMINSTER OPHTHALMIC HOSPITAL.—This hospital, which has been under construction on its new site in Broad-street, Holborn, since November, 1926, is now completed and will be open for the admission of in-patients on Monday, Sept. 3rd. The out-patient and casualty departments were opened last Easter. In addition to the public wards, there are 14 single private rooms, which will be available in the autumn. The new hospital has cost, including the freehold site, about £150,000, towards which nearly £100,000 has been raised by the sale of the old site in King William-street, Strand, and by public appeal. The remaining £50,000 has yet to be found.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.1.

MONDAY, Sept. 3rd, to Saturday, Sept. 8th.—QUEEN MARY'S HOSPITAL, Stratford, E. Second week of Intensive Course in Medicine, Surgery and the Specialties. Syllabus on application to the Secretary.

Appointments.

BRECHIN, F., M.B., B.Ch. Glasg., D.P.H., has been appointed Medical Officer of Health, Renfrew.

DAVIDSON, M., M.D. Oxf., F.R.C.P. Lond. Consulting Physician to St. Luke's Hospital, Chelsea.

DUNSCOMBE, CLEMENT, M.B., B.Chir. Camb., D.P.H. Oxf., Medical Officer of Health for Mansfield Woodhouse, Notts., and Assistant School Medical Officer, Nottinghamshire County Council.

LOBBAN, G. M. D., M.B., Ch.B. Leeds, Assistant Schools Medical Officer, Oldham.

MITCHELL, L. M. V., M.B., Ch.B. Edin., to be one of the Medical Referees under the Workmen's Compensation Act, 1925, for Inverness (Mainland) District of the Sheriffdom of Inverness, Elgin, and Nairn.

ROWNTREE, S. J., M.R.C.S., L.R.C.P. Lond., Certifying Surgeon under the Factory and Workshop Acts for Islington.

STEVENS, W. G., L.R.C.P., L.R.C.S. Edin., Consultant Medical Officer of Health, Renfrew.

THOMSON, H. W., M.D. Glasg., a Specialist Medical Referee under the Workmen's Compensation Act for Ophthalmic Cases in the Sheriffdom of Lanark.

Surgeons under the Factory and Workshop Acts: BELLIS, T. M.B., Ch.B. Liverp. (Llanfairfechan); BRUCE, D. W. (Chagford, Devon); ELLIS, G. E., M.B., B.S. Lond. (Bourton, Dorset).

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.

All Saints' Hospital, 49–55, Vauxhall Bridge-road, S.W.—H.S. At rate of £150.

Birmingham and Midland Eye Hospital, Church-street.—H.S. £110.

Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200.

Brighton Education Committee.—Asst. Sch. M.O. £600.

Cairo, Egyptian University.—Faculty of Medicine: Professor of Forensic Medicine. L.E. 1500. Also Prof. of Clin. Surg., &c.

Canterbury, Kent and Canterbury Hospital.—3rd Res. M.O. At rate of £125.

Cheltenham Borough.—M.O.H. and Sch. M.O. £850.

Chester Royal Infirmary.—H.P. £120.

Croydon General Hospital.—Cas. H.S. £125.

Dorchester, Dorset County Hospital.—H.S. At rate of £120.

Dreadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110.

Eastbourne, Princess Alice Memorial Hospital.—Jun. H.S. At rate of £100.

Exeter, Wonford House.—Deputy Medical Supt.

Hull City and County of Kingston-upon-Hull.—Asst. M.O.H. £600.

Leeds City Hospitals.—1st Asst. Res. M.O. £450.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Lowestoft, St. Luke's Hospital.—Med. Supt. £800.

Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Res. M.O. At rate of £125.

Manchester, Monsall Hospital for Infectious Diseases.—Second Asst. M.O. Also Jun. M.O. At rate of £375 and £350 respectively.

Manchester, Royal Children's Hospital, Gartside-street.—Asst. M.O. At rate of £150.

Manchester, Royal Children's Hospital, Pendlebury.—Res. Surg. Officer. At rate of £125.

Metropolitan Ear, Nose and Throat Hospital, Fitzroy-square, W.—H.S. £150.

Miller General Hospital for South-East London, Greenwich-road, S.E.—Pathologist. £600. Also H.P. At rate of £125.

National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. At rate of £150.

Northampton General Hospital.—H.P., H.S., and two Asst. H.S.'s. Each at rate of £150.

Patna Medical College.—Prof. of Physiology. Rupees 1200.

Plymouth, Homœopathic and General Hospital.—H.S. At rate of £100.

Prince of Wales's General Hospital, Tottenham, N.—Res. Anæsthetist. At rate of £120.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Asst. Res. M.O. At rate of £80.

St. George's Hospital Medical School, S.W.—Pathologist and Lecturer in Pathology. £575.

St. Mary's Hospital, W.—Asst. Pathological Chemist. £300.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.

Salford Municipal Maternity Home and Babies' Hospital, Seedley-terrace, Pendleton.—Asst. Maternity and Child Welfare M.O. £600.

Salisbury General Infirmary.—H.S. £150.

Shrewsbury, Royal Salop Infirmary.—Res. H.S. At rate of £160.

Truro, Royal Cornwall Infirmary.—H.S. £170.

Tunbridge Wells and Counties General Hospital.—H.S. £160.

Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.

West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. Each at rate of £100.

Westminster Hospital, Broad Sanctuary, S.W.—H.S. to Eye, Ear, Nose and Throat Depts. At rate of £102.

Wolverhampton and Staffordshire Hosp.—H.S. At rate of £150.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Langport (Somerset) and Aspatria (Cumberland).

The Home Secretary gives notice that in consequence of the death of Dr. A. Stuart, Medical Referee under the Workmen's Compensation Act for the Central District of the Sheriffdom of Perth, the appointment held by him is vacant. Applications for the post should be addressed to the Private Secretary, Scottish Office, Whitehall, London, S.W.1, and should reach him not later than Sept. 19th, 1928.

Births, Marriages, and Deaths.

BIRTHS.

BALTER.—On August 14th, at Avenue-road, N.W., the wife of David N. Balter, M.D., of a son.

HINGSTON.—On August 20th, at Uplands Cottage, Belvedere-drive, Wimbledon Hill, S.W., the wife of Major H. Hingston, I.M.S., of a son.

RICHARDS.—On August 15th, at Adelaide-road, N.W., the Hon. Noel Olivier, wife of W. Arthur Richards, F.R.C.S., of a daughter.

RUSSELL.—On August 24th, at "Bredon," Alverstoke, Hants, the wife of Dr. Norman L. Russell, of a son.

SKEGGS.—On August 26th, at Bicknor Lodge, Stevenage, the wife of Dr. B. Lyndon Skeggs, of a son.

SMALLEY.—On August 21st, the wife of Dr. L. Smalley, Montfort Cottage, Kenilworth, of a daughter.

TROTTER.—On August 27th, at "Braemar," Haslemere-road, London, N., the wife of Dr. G. Clark Trotter, M.O.H., Islington, of a daughter.

MARRIAGES.

SHELDRAKE—LANE.—On August 18th, at the Parish Church, Leamington Spa, William Donbavand Sheldrake, M.B., B.S. Lond., to Ida Frederica Lane, youngest daughter of the late Mr. and Mrs. W. Billings Lane, of Bottisford, Lincolnshire.

DEATHS.

GREENWAY.—On August 19th, at Alexandra-drive, Surbiton, Charles Melville Greenway, M.R.C.S., L.R.C.P. (late of Plumstead), aged 58.

HUGHES.—On August 23rd, at Bristol, following an operation, Frank Percival Hughes, M.B., B.S.

KEBBELL.—On August 8th, at a nursing home, Earl's Court, Charles Frederick Vivian Kebbell, M.R.C.S., L.R.C.P., in his 42nd year.

KHAN.—At Gaya, India, on 20th July, 1928, Major Abdus Sattar Khan, I.M.S., from heart failure, aged 46. Deeply mourned.

MCVINE.—On August 16th, at Hazelwood-lane, N., Dr. J. W. McVine.

MOORHOUSE.—On August 17th, at Melville-terrace, Stirling, Dr. James Ernest Moorhouse, aged 58 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

HOSPITAL LAW.

LIABILITY OF HOSPITALS AND THEIR PROFESSIONAL STAFFS FOR TORTS.*

BY CAPTAIN J. E. STONE, M.C., F.S.A.A.,
HON. SECRETARY, INCORPORATED ASSOCIATION OF HOSPITAL OFFICERS.

Operations.

No surgical operation can be performed on an adult patient without his or her consent if it is at all possible to obtain it. No operation, therefore, should be performed on a patient without the express consent of the patient, or if he is not in a position to give such consent, then of his nearest relative. Further, an operation must not be carried further than is warranted by the consent, and this consent should be founded on full knowledge of the nature and possible extent of the operation and the consequences which it may involve. Disregard of these precautions may cause the operation to be illegal, and to render the surgeon liable to an action for damages. In the case of a child similar precautions should be adopted except that instead of the patient's consent, the consent of a parent or guardian should be obtained. Even in the case of a child, it may be advisable to obtain his or her consent as well, especially if the child has attained years of discretion, for the power of the parent or guardian over the person of the child does not extend to the whole period of minority.

When a person has selected a surgeon to operate upon him, and has appointed no other person to represent him during the period of unconsciousness that constitutes a part of such operation, the law will by implication constitute such surgeon the representative of the patient, and will cast upon him the responsibility of so acting in the interests of the patient that the latter shall receive the full benefit of that professional judgment to which he is legally entitled. A surgeon undertook to perform a radical cure of a left inguinal hernia, and to do it gratuitously. When the patient was anæsthetised and ready for the operation to commence, a more serious rupture was found to exist on the right side. The surgeon accordingly dealt with the right hernia first, intending to deal with the left one afterwards. However, by the time the first operation was complete, the patient's condition was not so good and the second operation could not be commenced. The patient brought an action for assault and was awarded substantial damages; but a higher court set aside this decision on appeal. The grounds for this were that the use of anæsthesia modified the fundamental common law rule that consent must be given before an operation can be performed. Anæsthesia had postponed to the period of relaxation and unconsciousness the making of the complete and final diagnosis of the case, by which time consent could no longer be asked or obtained. These changed conditions are all for the benefit of the patient, and to allow them to be used as the basis of actions for assault or *mala praxis* would be contrary to the public interest. It will be noted that the decision is safeguarded by language which makes it safe from abuse, and confers no liberty upon the surgeon to carry out a more extensive or more dangerous operation than that for which he has obtained consent. A record of all professional staff in attendance at operations should be kept.

Who may Bring Action?

The only person who can properly bring an action for damages done to the person of the patient is the patient himself, even though a minor; otherwise in all cases of surgeons retained by any of the public establishments the patient would be without redress, for it could hardly be expected that the governors of a hospital would bring an action against the surgeon employed by them to attend the child of poor parents who may have suffered from his negligence and inattention (Pippin and Sheppard). Formerly, when a patient died as a result of the negligent treatment of a doctor or nurse, any right of action which he might have had in his lifetime ceased on the principle of the well-known maxim, *Actio personalis moritur cum persona*. By the Fatal Accidents Act, 1846, more commonly known as "Lord Campbell's Act," and called "an Act for compensating the families of persons killed by accidents," it was enacted that whenever the death of a person shall be caused by wrongful act, neglect or default, such as would (if death had not ensued) have entitled the party injured to maintain an action and recover damages, then the person who would have been liable if death had not ensued shall be liable to an action for damages, notwithstanding the death of the person injured, and although the death shall have been caused under such circumstances as amount in law to felony. Such actions must be for the benefit of the wife, husband, parent, or child of the deceased; be brought by his personal representative, and be commenced within 12 calendar months after the death of the deceased. If there is no legal representative, all or any of the persons for whose benefit such action would have been brought may themselves bring the action.

Rights and Obligations of Patients.

Voluntary hospitals are under no legal obligations to admit as patients persons who come to them for treatment. The fact that an institution is charitable is not in itself sufficient to entitle the public at large to demand free treatment, and cases can therefore be refused without any reasons being given. This right to refuse admission is, however, seldom exercised without some adequate ground for refusal, but such refusal would give the rejected applicant no cause of action against the governing body or the admitting officer.

A patient on admission to hospital submits himself to carry out any rules and regulations prescribed by the hospital with a view to enforcing on the part of the patients decent and orderly behaviour and obedience to orders. All hospitals have such rules, and the retention of a patient is conditional upon his observing such of the rules of the hospital as relate to his own conduct. A patient is entitled to expect to be treated with reasonable care and skill; this care, however, is so much and no more than a patient in that hospital would, according to its rules and practice, in the ordinary course receive. For instance, patients cannot complain at being attended by junior medical officers in the intervals of the visits of the physicians and surgeons, or because matters not requiring the personal attention of a qualified practitioner are left to the sister or nurse of the ward, or if in accordance with the ordinary practice of the hospital students or others accompany the physicians on their rounds. A patient so long as he remains in the hospital is bound to submit to the treatment bona fide ordered by the physician, and to its administration at the hands of the nurses or other agents employed by the hospital to carry out the treatment prescribed. A patient cannot be detained or treated against his will. If he does not comply with the rules of the hospital the proper remedy is not compulsion but expulsion. If it is found necessary to use force to a patient who exhibits violence or is insubordinate, the force employed should be reasonable and never be greater than is absolutely necessary.

Summary of Hospital's Position.

A hospital is *not liable* for:—

(*a*) The negligence of surgeons, physicians, nurses, or other officers in the exercise of their professional duties, provided it is shown that in the selection and appointment of such officers due and reasonable care was exercised. This as a practical proposition exonerates hospitals in most suits by patients, for in the ordinary case hospitals do exercise such care. (The exemption from liability does not follow the hospital because it is a charitable institution.)

(*b*) The negligence of a nurse (or other officer) assisting at an operation or in the carrying out of her purely professional duties.

A hospital *is liable* for the negligence of:—

(*a*) Nurses in the course of purely administrative duties over which the board has control.

(*b*) Other officers while under the control of the board.

(*c*) Its professional staff (surgeons, physicians, &c.) in the course of their professional duties, if it has not exercised due and reasonable care in their selection and appointment.

The mere fact that the officers are or are not remunerated is immaterial. The board are under no greater liability to a paying patient than to a non-paying patient.

Liability to Persons other than Patients.

Hospitals are liable for the negligent injury of those who do not bear to the hospital the relationship of patient—that is, those who are not beneficiaries of the hospital and its charitable purpose. In such suits hospitals are held by the law, as are all other concerns and individuals, to the use of due care—that is, such care as a prudent person would under like circumstances exercise, and failing in that would be liable in such damages as would fairly compensate the injured person. While, therefore, hospitals are held by the weight of judicial opinion to be exempt from liability for injuries to the recipients of their charity if they have selected their staffs with due care, no such exemption applies to injuries to others. Even though it has been proved that there was due care in the selection of the agents or servants where the relation of patient does not exist, and when the hospital would otherwise be liable, there is no exemption to the hospitals. Hospitals are bound to use ordinary care to have their premises in a reasonably safe condition. Cases coming under this heading would include injuries due to (1) defective lifts, (2) a lift shaft negligently left unprotected, (3) collision with hospital ambulance, (4) defective stairs, (5) falling roof slates or tiles, &c. The absence of reasonable care must, of course, be proved.

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* Two previous articles on this subject were published in THE LANCET of April 28th, p. 895, and July 14th, p. 102.

This phase of a hospital's liability is not confined to what may be termed strangers—i.e., persons other than patients—but it also includes the employees of the hospital. For instance, injuries suffered by a laundry worker, if not properly instructed in operating the machinery which it was her duty to work, or if caused by insufficient protection or defective condition of the machinery, would give good grounds for maintaining an action against the hospital. The fact that employees receive no money for their services, but only lodging, board, and uniforms, does not defeat their right to bring an action. Nearly all hospitals contract out in respect of their liabilities falling under both the above headings; one or two undertake their own risks by the establishment of insurance funds, into which annual premiums are paid and out of which all accident claims are met.

St. Thomas's Hospital, London, S.E.

"THE WELL OF LONELINESS."

THE fact that "The Picture of Dorian Gray" is now available in cheap editions, while "The Well of Loneliness" has been withdrawn by Messrs. Jonathan Cape at the request of the Home Secretary, suggests that Miss Radcliffe Hall's book may at some future date be restored to circulation. It is not, of course, comparable in artistic merit with Wilde's work, nor even with Miss Radcliffe Hall's previous novel, but it is an honest attempt to portray the temptations, the emotional conflicts, and the social dilemmas of the homosexual woman. The author has considerable dramatic skill, though her emphasis is sometimes misplaced. The implication that the parents' desire to produce a son may alter the emotional affinities of the daughter born to them is difficult to accept; the origin of abnormal sex attractions cannot be so simply explained. The fallacy of the book lies in the failure to recognise that strong attachments between members of the same sex occur as a phase of normal development. Those who fail to outgrow this phase can be helped to divert their emotions into other channels. If their efforts are ineffectual their life must always be unhappy, for the race is bound to erect such barriers as will discourage the development of affinities dangerous to its existence. This duty is well recognised by Miss Radcliffe Hall. Her book, to which Mr. Havelock Ellis contributes a preface, is certainly not effective as a presentation of the case for social toleration of an abnormal habit of life, nor is there any evidence that the author holds a brief to this end.

JUNGLE AND MALARIA.

THE idea is widespread in the Federated Malay States that jungle causes malaria and that therefore ravines should be cleared of jungle and secondary growth. The Malaria Advisory Board states, however, in its report for 1927, that this is by no means always true, and many instances are known in which severe outbreaks of malaria have been caused by clearing jungle. An emphatic warning has therefore been issued against indiscriminate felling of jungle, and the attention of the public is invited to the following points: (1) If the health of those living close to a jungle-covered ravine is good, on no account do any clearing. (2) If the health is not good, owing to attacks of malaria, search thoroughly for other possible sources of mosquitoes before blaming the jungle. (3) Do not clear a ravine, unless you are prepared to drain and oil it thoroughly. (4) Sometimes jungle is dangerous, but before felling it you should seek the advice of your medical practitioner. The Health Department will be glad to coöperate with him in this important matter.

The Health Department of the F.M.S. states its willingness to coöperate with the local practitioner in coming to a decision.

REPORT OF THE IMPERIAL SOCIAL HYGIENE CONGRESS.

WE have received from the British Social Hygiene Council a copy of the proceedings of the Imperial Social Hygiene Congress held at Caxton Hall from Oct. 3rd to 7th, 1927. The Congress was reported at some length in our columns at the time (see THE LANCET, 1927, ii., 782, 829); and Mr. Neville Chamberlain in a preface expresses a hope that the record will have a wide circulation amongst those who are working to raise the moral and social standards throughout the Empire. The report deals in succession with the imperial, medical, and administrative aspects of social hygiene; a full index makes it possible to refer rapidly to work recorded in any part of the Empire. The report can be obtained from the Council at Carteret House, Carteret-street, London, S.W. 1.

NEW PREPARATIONS.

Atophan Balsam (Messrs. Schering, Ltd., 3, Lloyd's-avenue, London, E.C. 3. Manufacturers: Schering-Kahlbaum A.G. Berlin, N.39).—The use of atophan in facilitating the elimination of uric acid in gout and rheumatic affections, as well as its value in neuralgia and sciatica, are well known. It is now made in the form of a balsam, being an association of atophan-amylester 10 per cent., phenyl salicylate 10 per cent., and camphor 5 per cent., with a fatty soap base. The balsam can be used externally either per se or as a supplement to internal treatment by atophan. Experiments have shown that the preparation has high absorption qualities, confirmation being given here by the excretion of the components into the urine. The use of the preparation is particularly indicated where local and massage treatment are required simultaneously. It is put up in collapsible tubes. About ¼ oz. per day is recommended for use, and the tubes contain about 1¼ oz.

Zymocide (Messrs. Reed and Carnrick, Jersey City, N.J. Agents: Messrs. Coates and Cooper, 41, Great Tower-street, London, E.C. 3).—This is described as an antiseptic consisting of eucalyptol, thymol, menthol, methyl salicylate, boric, and benzoic acids with other aromatic ingredients and alcohol 20 per cent. by volume. It is non-irritating and non-poisonous, and is intended for use as a general antiseptic where it already enjoys popularity as a vaginal douche and a mouth wash. A 25 per cent. solution has been employed for cleansing the eyes following traumatism, and in the treatment of conjunctivitis, blepharitis, catarrh of the lacrymal passages and other ocular inflammations. It is put up in bottles containing 14 fluid ounces.

Robinson's "Patent" Barley in Powder.—Messrs. Keen, Robinson and Co., Ltd., Carrow Works, Norwich, have sent us a specimen of their well-known product, used as a food for infants and for making potable barley water and barley puddings. As a result of suggestions and criticisms from medical men they have now fixed on the tin, in addition to the directions, a table of food recipes specially designed for infants. The table gives in parallel columns the age of the infant for the first four weeks, and thereafter for the first nine months of its life, and the weight in pounds which is recognised as agreeing satisfactorily. Further columns give the quantity of the suggested foods and the number of feeds per day in accordance with the age and weight. A note on this table of recipes pointing out that infants should preferably be fed by weight rather than by age gives advice which might far more frequently be acted upon by the public—viz., that where the weight of an infant does not clearly correspond with the age the medical man should be consulted.

THE BUCKSTON-BROWNE PRIZE.

A CORRESPONDENT asks for details in regard to the Buckston-Browne prize to which he has found a reference in our columns. The prize was founded by Mr. Buckston-Browne, to whom the medical profession is indebted for his generosity in many directions, in memory of a son who lost his life in the war. The interest on a sum of money given for the purpose provides a cheque for £100 and a medal which are given for the best essay on some subject selected by the Council of the Harveian Society. The prize is awarded every two years, the first award having been made in 1927 to the late Mr. Lionel R. Fifield for his essay on new growths of the urinary bladder. An amplification of that excellent essay was reviewed in THE LANCET recently.

A BROCHURE ON TEA.

WE have received from the Mazawattee Tea Company, Ltd., an illustrated booklet setting out the connexion of the company with the history of tea in an interesting manner. Figures are given to show the vast increase in importation of tea which has been accompanied by the dramatic fall in prices, the figures really forming a commentary upon social developments in the United Kingdom during some 250 years. The Mazawattee Tea Company in their pamphlet point out that they were the first firm to bring home to the public that, as dealt with by experts in the fine art of blending, teas grown within the British Empire could present all the qualities which made those of China popular. We do not suppose that anyone who is a real amateur of China tea would suggest that the blends have all the qualities which personally appeal, but the blends are held on good ground to have other qualities which form satisfactory compensation; anyhow, those of this firm have earned their wide reputation.

THE address of the Deutsche Medizinische Wochenschrift is now Berlin W. 30, Viktoria Luise Platz 1.

Ingleby Lectures

ON

SOME RECENT ADVANCES IN OUR KNOWLEDGE OF RICKETS AND ALLIED DISEASES.

Delivered at the University of Birmingham

BY LEONARD G. PARSONS, M.D., F.R.C.P. LOND.,
PHYSICIAN TO THE CHILDREN'S AND GENERAL HOSPITALS, BIRMINGHAM.

LECTURE II.*

ACCORDING to most authorities the primary defect in uncomplicated human rickets is an impaired absorption of phosphorus from the bowel. Findlay and the Glasgow School do not accept this view and regard defective calcium absorption as the essential factor. To determine which view is the correct one is, however, a matter of extreme difficulty, because the relationship between these two elements in all phases of their metabolism is so intimate and reciprocal (Murdoch).

FACTORS INFLUENCING THE ABSORPTION OF CALCIUM AND PHOSPHORUS FROM THE BOWEL.

Excessive amounts of calcium in the diet tend to increase its absorption and retention but to impair phosphorus retention with the result that considerable amounts of phosphorus are diverted from the urine to the stools. Conversely, if the phosphorus in the diet is excessive, calcium metabolism is unfavourably influenced, there is an increase of calcium in the fæces, and its excretion in the urine becomes less. This retention of one element in the intestine by an excessive amount of the other is best explained by the formation of insoluble calcium phosphate. To obtain the maximum absorption of both elements the diet should, therefore, contain amounts of calcium and phosphorus sufficient in quality and properly balanced, the percentage of calcium being greater than that of phosphorus. Both these requirements are met if children take one pint of milk daily.

Another important factor in the absorption of calcium is the presence of certain fats in the dietary and their normal absorption from the intestine. Infants with a normal fat absorption must take from 2 to 6 g. of butter fat per kilo of body-weight to ensure the absorption of 0·1 g. of calcium oxide per kilo of body-weight. A child fed on a low fat dietary may, indeed, show a negative calcium balance. An infant whose diet, a milk mixture containing 2 per cent. of fat, contained 0·44 g. of calcium oxide per day, showed a percentage absorption of 34; whereas when fed for 17 days on a mixture containing 0·8 per cent. of fat, it showed a negative calcium balance, although the calcium intake was more than twice as much as on the previous diet (due to the addition of calcium caseinate). The presence of large amounts of unabsorbed fat in the intestine may also lead to a negative balance; thus a negative or low calcium retention is often found in cœliac disease. Again, in infantile biliary cirrhosis, owing to the exclusion of bile from the intestine, fat absorption is very defective. In one case of this disorder a negative calcium balance and in another a low retention was found. (See Table I.)

Telfer has produced evidence showing that the absorption of calcium only occurs in the upper part of the intestinal tract. The solution of the calcium salts in the food is effected by the acid of the gastric juice, and absorption proceeds until the acid mixture of lime and phosphoric acid is rendered alkaline by the intestinal secretions, when calcium phosphate is precipitated in insoluble form. It has, therefore, been suggested that an increased acidity in the upper part of the intestinal canal would increase the absorption of calcium. Bergeim maintains that acidity, and especially lactic acid fermentation, increases absorption of calcium, and has shown that lactose largely promotes its absorption, whereas maltose and glucose do so to a much lesser degree if at all. Breast milk contains much less calcium than cow's milk, but it is almost completely absorbed; this, he believes, is the result of a high proportion of lactose and of the acid intestinal reaction in breast-fed infants. My own observations lead me to believe that an increased acidity alone does not necessarily cause increased calcium—although it does produce increased phosphorus—absorption. Thus in the cases of biliary cirrhosis, to which I have referred, large amounts of fatty acid were present in the intestine, yet calcium absorption was very poor, and in one case there was a negative balance.

TABLE I.—*Infantile Atrophy.**

—	Calcium.		Phosphorus.	
	Intake.	Percentage absorbed.	Intake.	Percentage absorbed.
Cow's milk ..	1·04 (31 cases)	45·6	—	—
Lactic acid milk	1·32 (14 cases)	35·4	0·76 (11 cases)	71·3
HCl milk	1·22 (6 cases)	51·6	0·62 (1 case)	85·3
Almata	0·92 (6 cases)	72·5	0·63 (1 case)	46·5
Biliary cirrhosis.				
Cow's milk (M. C.)	0·98	0	1·07	92·1
	1·44	0	1·32	85·7
Lactic acid milk (A. J.)	1·35	13·9	0·66	94·9

We have carried out observations on a number of atrophic infants fed on varying dietaries, some being fed on acid milk. The average calcium absorption of 14 infants fed on lactic milk was considerably less than that in a group of 31 infants fed on ordinary cow's milk mixture. This may in part be due to the fact that children fed on lactic acid milk excrete more fat than those fed on ordinary milk mixtures. Four children fed on hydrochloric milk (prepared by adding one ounce of decinormal hydrochloric acid to four ounces of milk), however, showed a higher absorption of calcium, and although there was a marked increase in the amount of calcium excreted in the urine, the actual calcium retention was definitely higher than in children fed on cow's milk. Finally, a group of six infants fed on Almata, a food which has a buffer value similar to that of breast milk, showed the highest calcium absorption of all the children examined. Increased phosphorus absorption, as the result of increased intestinal acidity from excess of fatty derivatives in the intestine, is to be explained by the formation of large amounts of insoluble calcium soaps so that less calcium is available to bind phosphorus and the latter can be absorbed. (See Table I.)

The absorption of calcium and phosphorus from the bowel can be increased by the oral administration of cod-liver oil, ostelin, irradiated ergosterol, or by exposing the skin to the sun's rays, or by artificial ultra-violet irradiation. Moreover, rats fed on a high-calcium, low-phosphorus, rickets-producing dietary develop a marked alkalinity of the fæces which can be reduced to the acid side of neutrality by any of those methods. Again, the child fed on a low fat dietary, having a low or negative calcium retention, can be made by such methods to absorb calcium well; and in cœliac disease the same results are obtained by irradiation or the administration of irradiated ergosterol in solid form. From all of these considerations it would appear that it is not intestinal acidity *per se* that is so important in absorption, but the presence of some factor (vitamin D), which directly increases absorption and also produces an acidity, and that the reason why some fats, such as cod-liver oil, are necessary for proper absorption of calcium and phosphorus is that they contain this vitamin.

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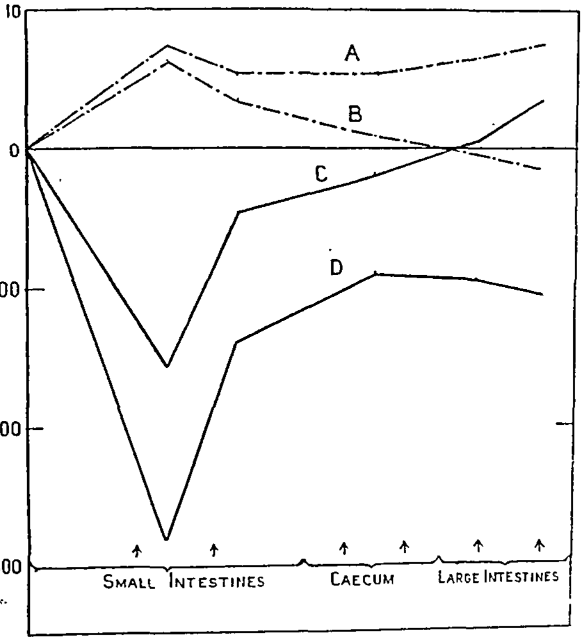
* The figures given represent the amounts taken in grammes in 24 hours.

* Lecture I. appeared in THE LANCET of Sept. 1st.

New light has been shed on the question of calcium and phosphorus absorption by work carried out by Bergeim. Albino rats were fed for 25 days on a high-calcium, low-phosphorus dietary and rickets was produced. They were then divided into two groups; to one group were given ten drops of cod-liver oil daily for five days, to the other, ten drops of olive oil. The animals were then killed and estimations made of calcium and phosphorus in the small intestine, cæcum, and large intestine; the results are seen in the diagram. Both groups of animals showed considerable calcium absorption in the small intestine. On this diet, which produces a low phosphorus rickets (the analogue of human rickets), the rachitic condition could not therefore be due to a failure of calcium absorption. In the same area both groups also showed considerable excretion of phosphate—i.e., excretion of phosphate appeared to be an important factor in promoting calcium absorption. In the lower bowel, in the animals receiving cod-liver oil, there was an approximate balance between excretion and absorption of calcium and a high calcium balance resulted. Phosphorus was also reabsorbed so as to bring about a positive balance. In the other group calcium excretion was more marked than absorption, leading to a negative balance; also there was a failure of phosphate to be adequately reabsorbed so as to produce a positive balance. The re-excretion of absorbed calcium into the lower bowel, so that a negative balance results, must be due to the failure of the bones to fix calcium. This failure, as pointed out in the first lecture, is not due to defects in the bone cells but to low blood phosphate, which, in Bergeim's view, is the result of the inability of the tissues of the body to maintain the proper concentration of blood phosphate by breaking down the organic phosphates which they contain. Antirachitic vitamin, he believes, facilitates this action and therefore elevates blood phosphate, and the absorbed calcium is deposited in the bones. The absorbed calcium is hence not re-excreted in the lower bowel, phosphate absorption is unhindered, and the phosphate balance becomes positive. I am not convinced that Bergeim's explanation is correct in all its details, although his results appear to be incontrovertible. A reference to the diagram shows that, although it would appear as if excretion of phosphate favoured calcium absorption, yet in those animals receiving cod-liver oil the calcium absorption in the small intestine was higher with a smaller excretion of phosphate. Further, he states that in three non-rachitic rats which were fed on a milk diet which was high in calcium and phosphorus "an acid condition generally prevailed throughout the intestines, due presumably to lactic acid fermentation, and both calcium and phosphorus were absorbed to a considerable extent in the small intestines." Also, if phosphate excretion favours calcium absorption, it is not clear how calcium excretion hinders phosphorus absorption. Indeed, if his arguments are correct the reverse process would appear the more logical. It is, I think, much more probable that the antirachitic vitamin exerts its effect by an alteration of the pH of the intestinal canal rather than by any action such as Bergeim suggests. Reference has already been made to the influence of acidity of the intestinal canal on the absorption of calcium and phosphorus and to the fact that this acidity is largely due to the presence of the antirachitic factor. Recently Redman, Willimot, and Wokes have estimated the pH of contents of various sections of the gut of rodents by a method similar to that of Bergeim, and the curves they obtained on a low fat rachitogenic diet show that the fæcal alkalinity corresponds well with Bergeim's curve of calcium absorption. Administration of cod-liver oil or irradiated cholesterol to these animals restored the acidity of their intestinal tract.



Average absorption of calcium and phosphorus from intestines of rachitic animals and animals given cod-liver oil. A, cod-liver oil: calcium. B, rickets: calcium. C, cod-liver oil: phosphorus. D, rickets: phosphorus.

From this review it will be seen that it is almost impossible to say which of the two, calcium or phosphorus absorption, is actually at fault; probably both are, but perhaps on the whole the evidence favours the view that defective absorption of phosphorus is the more important.

TETANY.

Infantile tetany is very closely associated and frequently occurs with rickets, in fact, some authorities regard it as a nervous manifestation of rickets. In all cases of infantile tetany the serum calcium is low. The blood phosphorus may also be low, indeed it always is so if there are manifest symptoms of rickets, but the presence of low serum calcium is pathognomonic of infantile tetany and is the one characteristic sign of the disease. In manifest tetany the calcium may fall as low as 6 mg. per cent., and in latent tetany it is usually about 8 mg. per cent. Now calcium exists in the blood in both ionised and un-ionised forms. The un-ionised form is in part inorganic as bicarbonate and acid phosphate. Cameron and Moorhouse have suggested that the calcium content of the cerebro-spinal fluid, normally 5·3 mg. per cent., may be regarded as the amount of diffusible calcium —i.e. the inorganic and ionic calcium. In infantile tetany the calcium in the cerebro-spinal fluid is greatly reduced and may be entirely absent. From the results of experiments on the filterability of the blood calcium through collodion membranes under a negative pressure, and by means of the Rona-Takahashi equation, the amount of calcium present as ions in the blood in small children has been estimated to be 2·1 to 3·4 mg. per cent. with an average of 2·6 mg. All the methods of directly determining the amount of ionic calcium are open to considerable criticism; this is unfortunate, because the work of Loeb and others has shown that the excitability of the neuro-muscular mechanism depends on the relative concentration of the calcium, magnesium, sodium and potassium ions, according to the formula: $\frac{Na+K}{Ca+Mg}$. In infantile tetany potassium, magnesium, and sodium in the serum are all normal, and it is, therefore, the ionic calcium which is the determining factor in the onset of the disorder.

Tetany, of the same nature as infantile tetany, also occurs in cœliac disease. It may, however, appear without any diminution in blood calcium, as, for instance, in gastric tetany, a condition which may develop when there is continuous vomiting of acid gastric contents. This sometimes happens in pyloric stenosis of infants and is the explanation of the convulsions which occur in that disease, and which sometimes prove fatal. Examination of the blood in such cases reveals that there is a shift of the pH to the alkaline side—i.e., an alkalosis—as a result of which less calcium is ionised and tetany results.

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The loss of hydrochloric acid by vomiting and the lack of reabsorption in pyloric stenosis produces an alkalosis. The occurrence of tetany after large doses of bicarbonate of soda is also due to alkalosis, as is that form known as superventilation tetany, which is brought about by forced respiration and in which the blood calcium is normal. This is undoubtedly the cause of the convulsions which are occasionally seen after rapid respirations in children suffering from post-encephalitic respiratory tic. (See Table II.)

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—	Blood.		
	pH.	Calcium.	Phosphate.
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Phosphate ..	Normal.	Low.	High.

The threshold mechanism of blood calcium (of 10 mg. per cent.) appears to be a very delicate one. The calcium content can be raised above normal by intravenous injection of calcium salts, but the rise is a fleeting one and the extra calcium is soon excreted into the alimentary canal and the normal restored. Recently Collip has shown that the parathyroid glands contain a hormone which raises the blood calcium. Injection of large doses may produce hypercalcæmia and death, but even using this hormone it is necessary to repeat the injection frequently to maintain the blood calcium above threshold value. In tetany, as we have seen, blood calcium is diminished, but the parathyroid hormone raises it to normal and cures tetany, although only for a short time unless the dose is repeated. It is possible, in animals from whom the parathyroids have been removed so that tetany has been produced, not only to cure tetany by means of the hormone but also to produce hypercalcæmia and death. The parathyroid hormone, however, does not increase the absorption of calcium from the bowel, but actually mobilises the fixed calcium from the bones and other reservoirs, and its function appears to be to maintain the calcium of the blood at the normal level and to balance the distribution of calcium between the tissues and the blood. It is, therefore, useless in the treatment of tetany unless means are also taken to increase calcium absorption from the bowel.

We must envisage rickets as usually primarily a functional disorder of the intestinal tract whereby calcium or phosphorus, or both, are not properly absorbed, either because there is an inefficient supply of these elements or because of the absence of vitamin D. Since this vitamin can act whether supplied from the skin by inunction or when taken by the mouth, it seems probable that it acts after absorption from the intestines and not, as suggested by some authorities, by a local action on the intestinal mucous membrane. The injection of cod-liver oil subcutaneously has been stated to have little or no effect on rickets, probably owing to the difficulty in dealing with fat that has not been through the processes of digestion. The antirachitic factor in cod-liver oil has been found to be contained in the unsaponifiable fraction of the oil, and by injecting intramuscularly a concentrate of this active fraction, Wilkins and Kramer produced a cure in two cases of active rickets. This is strong, although not conclusive, evidence that the antirachitic effect of the oral administration of cod-liver oil occurs as a result of absorption of the oil. The absorption of fats containing vitamin D should therefore be essential for the prevention of rickets, or, conversely, a child who is taking a fat-free diet, or who is not absorbing fat properly, should develop rickets. I have already mentioned the effect on the calcium balance of a diet of skimmed milk, and of the presence of large quantities of unabsorbed fat in the intestines, and also the occurrence of xerophthalmia in babies fed on a skim milk dietary.

There are certain conditions in childhood associated with defective fat absorption, of which the most important are severe and lasting jaundice, such as occurs with congenital obliteration of the bile ducts and some forms of cirrhosis of the liver; diarrhœa; cœliac disease. I have never seen xerophthalmia in any of these conditions, but Bloch and Wagner have described its occurrence in association with severe and lasting jaundice. The amount of unabsorbed fat in those forms of icterus is very great, yet, in spite of the fact that these infants have a low or negative calcium balance, they do not develop rickets. The probable explanation of this apparent anomaly is that growth in such conditions is practically inhibited, and in infants where there is no growth, there is no rickets. That these children may, however, develop rickets when growth starts is well illustrated by a case recorded by Bloch.

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In cœliac disease of long standing all grades of severity of rickets are met with, and here again growth is, I believe, the activating cause. The bone is osteoporotic before any considerable degree of growth occurs, although rickets rarely develops before the age of 7. The child suffering from cœliac disease passes copious stools containing large amounts of undigested fat, for the treatment of which it is necessary to give a low fat dietary and therein lies the reason for the onset of cœliac rickets. Whilst this is correct, the amount of fat absorbed in cœliac disease on a full fat diet is often considerably higher than would be expected on clinical grounds, and very much greater than occurs in chronic jaundice; indeed, on a low fat dietary, such as skimmed protein milk, the absorption may reach the high figure of 94 per cent. Even with the deliberate addition of fat to the diet for short periods, although the amount present in the stool is increased, yet the amount absorbed is considerable and indeed, within limits, the higher the fat intake the greater the amount of fat is absorbed. Any attempt to prevent the onset of rickets by giving cod-liver oil, however, is unsuccessful because, as with any other extra fat, if continued for more than a short period, an increase in the diarrhœa, the size, offensiveness, and fat content of the stool is produced, and the child goes downhill. On the other hand, a low fat dietary improves the clinical condition and as a result growth may occur and rickets develop. Examination of the blood in cœliac rickets usually shows low serum phosphorus and calcium, and the condition can be cured by administration of dry irradiated ergosterol, or cholesterol, or by exposure to the ultra-violet rays. All this is evidence that the disease is due to fat-soluble vitamin deficiency, yet in spite of this xerophthalmia has so far not been reported, although growth is severely stunted. We have, therefore, acidity *per se* that is so important in absorption, but the presence of some factor (vitamin D), which directly increases absorption and also produces an acidity, and that the reason why some fats, such as cod-liver oil, are necessary for proper absorption of calcium and phosphorus is that they contain this vitamin.

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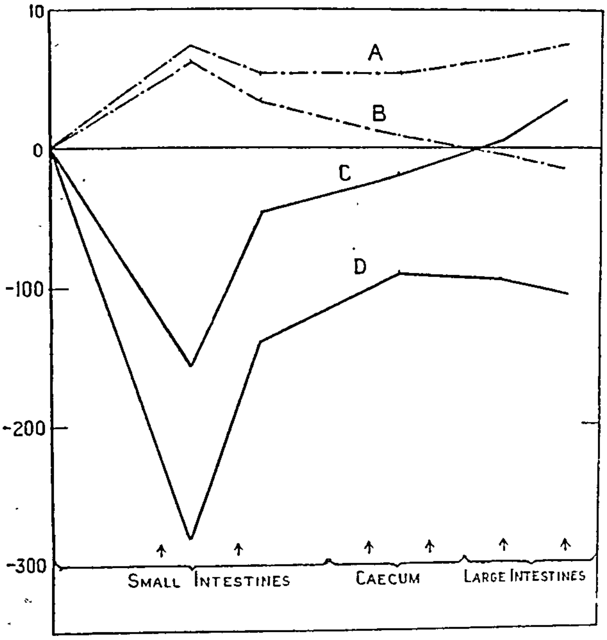

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It is not very unusual to meet with cases of rickets which appear to resist treatment by cod-liver oil but which respond to treatment by light or by the administration of ergosterol. One such case was reported to have been under treatment with cod-liver oil for years, but at the age of 7 was unable to walk because of severe and progressive rickets. Radiograms showed an extreme degree of osteoporosis and a large rachitic metaphysis. Treatment by light and ergosterol has, however, completely healed the bones, and the child is now able to walk. In another case, in spite of a life spent under ideal conditions, most careful dieting and the administration of cod-liver oil, a girl presented, when 3 years old, evidence of rickets of moderate degree, which has increased slowly until her present age of 8 years. There was a history of mild digestive disturbances, and examination of her stools showed a higher fat content than usual, and therein, in my opinion, lies the cause of her rickets, which I believe can be cured by light and ergosterol. Both these children were smaller than normal children of the same age, and although they could not be classed as cases of cœliac disease they are, in my opinion, examples of a subnormal absorption of fat—particularly the fat-soluble vitamin D—extending over a long period of time. Cases of cœliac rickets and those to which I have just referred require treatment for much longer periods than ordinary rickets in order to effect complete cure.

Diarrhœa, another cause of defective fat absorption in childhood, is of little importance in producing rickets because, unless the condition is one of cœliac disease, it is usually only transitory and, indeed, leads to starvation which produces arrest of growth and therefore absence of rickets.

RICKETS OCCURRING AS A RESULT OF DEFECTIVE EXCRETION

As already pointed out, there does not appear to be any bone disorder associated with defective calcium excretion, but a very different state of affairs exists with defective excretion of phosphate. The latter occurs in chronic interstitial nephritis, a disease which in children produces marked infantilism and not infrequently severe bone deformities ranging from a mild degree of genu valgum to the severest manifestations of rickets—"renal rickets." In these children the defect does not lie in the intake of calcium and phosphorus, nor is it due to the absence of vitamin D, or sunshine, but is purely a defective excretion of phosphate by the kidneys. Examination of the blood reveals nitrogen and phosphate retention, an acidosis, and frequently a high degree of lipæmia. The phosphorus values are often even higher than would appear at first sight, because, although 5 mg. per cent. is the normal concentration in infants, many of these children have reached an age when the normal blood phosphorus is considerably below that figure. Blood calcium in comparison with blood phosphorus is always low but in actual values is frequently at or above the normal figure of 10–11 mg. per cent., a very different state of affairs from that found in azotæmic nephritis of adults and after the injection of phosphate into animals or children.

In azotæmic nephritis of adults the higher the retention of phosphorus the lower is the calcium in the serum. Injection of phosphate into animals or children raises blood phosphorus, lowers blood calcium, and in some cases produces tetany. Why, therefore, does not blood calcium become low and tetany occur in renal rickets? I think the answer may be that the increased blood calcium is an effort on the part of the child to prevent tetany. Tetany is a serious disease, and to prevent it I suggest that the child mobilises calcium from the bones, producing osteoporosis and rickets, an action similar to that produced by the injection of parathyroid hormone. If that suggestion is true, administration of the hormone should definitely make renal rickets worse. In one case the bone condition was reported by my radiologist colleague (Dr. Teall) to be worse after administration of the hormone, but the variations in the state of the rickets are so marked in the ordinary clinical course of renal rickets that too much importance cannot be attached to this observation. Tetany does not occur in chronic azotæmic nephritis of adults in spite of the fact that the blood calcium is diminished; the explanation usually accepted is that advanced by de Wesselow, that in this form of nephritis there is an acidosis and usually a diminution of the bicarbonate content of the plasma, which conditions favour an increased ionisation of calcium. There is, however, another factor of importance in explaining the immunity of the adult from tetany. It has been shown that if the blood plasma is subjected to ultra-filtration under negative pressure there is a considerable diminution in the calcium content of the filtrate in tetany but not in chronic nephritis. In the latter, therefore, the diminution of calcium in the plasma is largely due to diminution in non-diffusible calcium, or, in other words, is chiefly due to diminution in calcium bound to protein. In renal rickets there is no diminution in the calcium of the filtrate. Indeed, as would be expected if my theory is correct, in some cases there is an increase. Occasionally, however, tetany does occur in renal rickets, but so far I have not been able to investigate a case. Acidosis occurs in renal rickets, and not only does it increase ionisation of calcium, but it also washes out calcium from the calcium reservoirs, and presumably from the bones (Ross and Scriver), and therefore helps to produce rickets.

There are, therefore, two factors which contribute to the causation of osteoporosis and rickets in these kidney conditions in childhood: (1) some mechanism, probably a protective one, which keeps the blood calcium at a higher level than is usual in an azotæmic nephritis; (2) acidosis.

There is, however, a third and much more important factor to be considered—namely, the defective excretion of phosphorus. It is possible to see rickets develop in a case of renal infantilism, heal, and then relapse. Thus there is produced a flux between healing and relapse, and this can be correlated with periods in which the blood-phosphorus waxes and wanes. If estimations of blood-urea or non-protein nitrogen are made, it is found that the curve of phosphorus retention parallels the curve of nitrogen retention. "Renal" infants pass through many attacks of uræmia before the final one closes their chequered career. Such attacks, I believe, make their rickets worse by increasing the disparity between calcium and phosphorus, whereas in the periods of improvement the phosphorus may even return to normal limits, with the result that the calcium-phosphorus ratio becomes normal and the rickets heals. Contributory factors in this healing are a lessened degree of acidosis, and a lessened depressing effect of phosphorus on calcium and of the resulting need to call on the calcium reservoirs.

I would also draw attention to the fact that anything which increases phosphorus absorption from the alimentary tract may make the condition worse. Definite evidence has, I think, been produced by Teall and myself showing that ultra-violet irradiation, far from ameliorating, actually increases the rachitic manifestations. Let me add in passing that in renal rickets we have another illustration of the effect of growth in the development of rickets, because in those rare cases which survive until the later 'teens, when the growth period has ceased and the epiphyses joined up, rickets does not occur, although the bone is still osteoporotic to some degree and the calcium phosphorus ratio is abnormal.

From what has been said it will be gathered that I regard renal rickets as belonging, like cœliac rickets, to the low calcium category. The occurrence of renal rickets also proves the importance of the calcium-phosphorus ratio, since if the calcium-phosphorus product were a correct guide it would put these deformities far outside the rachitic range. It may well be asked, therefore, what is the proof that the condition is rickets? I think no one will question the fact that some of the cases show a radiographic appearance absolutely indistinguishable from rickets (the "rachitic type"), but, on the other hand, there are radiographic manifestations which we have called the "woolly," "honeycomb," or "stippled type," which are totally unlike that seen in ordinary rickets. There is another type, which we have called the "atrophic type," which resembles cœliac rickets, and although I have never seen the rachitic change into the atrophic type I think they can do so, just as at times we see in uncomplicated rickets a radiological picture absolutely identical with the atrophic type and with cœliac rickets. In the "woolly, stippled, or honeycomb type" osteoporosis is present, the diaphysis is straight but there is a long metaphysis, and it is in the latter that the severe deformities so characteristic of the condition occur. The metaphysis shows irregular ossification, giving the appearance of honeycombing, stippling, or woolliness, and under the periosteum the bone may appear to be eroded. The changes do not appear to the same degree in all the long bones. As the change advances the absence of subperiosteal bone becomes so marked that the end of the bone collapses, and since this absence of bone is usually more marked on one side than the other the collapse usually occurs sideways, with the result that the most extreme deformities are produced. The skull in some cases of this type shows most extraordinary changes, marked stippling being present. In the severest case that I have observed all trace of inner and outer tables of the cranial bones had disappeared and the bone was much thickened, the whole presenting an appearance indistinguishable from Paget's disease. Post-mortem examination of the long bones shows that the woolliness or stippling is due to the presence of islets of cartilage deep down in the long metaphysis, and that the appearance of subperiosteal erosion is also due to unossified cartilage. The metaphysis itself, although long, is not broad and splayed out as in the rachitic type. Although this type cannot be recognised radiographically as due to rickets, and microscopical examination shows that the changes present differ from those ordinarily seen in rickets, the proliferative cartilage being much more irregular and broken, yet Prof. Haswell Wilson, who has examined the sections for me, pronounces them as definitely rachitic in nature—a view also held by Shipley.

CONCLUSION.

I hope that in these lectures I have made clear that recent advances in our knowledge have shown that rickets is a disorder of calcium and phosphorus salt metabolism, usually the result of defective absorption of these elements from the bowel; further, that this defective absorption is due either to an inefficient supply of these elements, or of some activating body in the tissue fluids; that this body is probably vitamin D, which in its turn is derived from the alimentary canal, or synthesised by the action of ultra-violet rays on sterols in the skin; but that occasionally the faulty metabolism may be entirely endogenous in origin, as occurs in renal rickets; and finally, that growth is an essential for the development of rickets.

Although rickets existed before Glisson's time it certainly increased markedly after his day, and became almost universal in some grades of urban society, especially in districts like our own Black Country and Glasgow. We must, however, remember that except for the empirical discovery of the curative effects of cod-liver oil some hundred years ago, our knowledge of the disease advanced very little until the last few years. Although there are still many gaps in our complete knowledge of the disorder, recent researches have put us in possession of information that should allow us completely to eradicate all ordinary rickets. Already its incidence and severity are declining, and we can look forward with sure and certain hope to the day, perhaps no further distant than the tercentenary of Glisson's work, when rickets will have become one of that small but increasing number of diseases which possess a great interest for the historian but happily present no terrors of ill-health for the patient and no cause for anxiety on the part of the doctor.

BONE FORMATION AND THE OSTEOBLAST.

By H. A. HARRIS, B.Sc. Cardiff, M.B. Lond.,
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> "Quid dicam de ossibus? quae subjecta corpori, mirabiles commissuras habent, et ad stabilitatem aptas, et ad artus finiendos accommodatas, et ad motum, et ad omnem corporis actionem."
>
> —*Cicero, De Natura Deorum.*

> "Scrape a bone, and its vessels bleed; cut or bore a bone, and its granulations sprout up; break a bone, and it will heal; or cut a piece away, and more bone will readily be produced; burn it, and it dies."
>
> —*Charles Bell, Anatomy.*

Cicero and Charles Bell have given pithy descriptions of the marvels of bone, the tissue which, in common with bone-marrow, displays the highest powers of regeneration and repair in the whole human economy. Sir Arthur Keith[1] has recently asked "Quid dicam de ossificatione?" The answer to the problem of ossification has not yet been found, and to review the search for the mode of ossification is to review the history of morbid anatomy. No subject has been attacked more vigorously, no subject has been deserted more frequently. When Monro Secundus and William Hewson were pleading a priority suit, in relation to their discoveries in the lymphatic system, with Benjamin Franklin as assessor, Abernethy said: "All our knowledge of the absorbing vessels has been obtained by fragments, and our future acquisitions must be made in the same manner." This is equally true of bone development. Our knowledge of the histological structure of bone is a memorial to three Englishmen: Clopton Havers (1650–1702), John Howship (d. 1841), and William Sharpey (1802–1880), who are familiarised in the canals, lacunæ, and fibres which bear their names. The bone corpuscles were first described by Purkinje and Deutsch in 1834. The specific terms "osteoblast" and "osteoclast" as applied to cells actively engaged in depositing or absorbing bone respectively were introduced by Gegenbaur and Kölliker and came into general use 60 years ago. It is of interest to note that as early as 1689, just after the invention of the Huyghens eye-piece, Gagliardi, a professor of medicine in Rome, had described certain "claviculi" or "small nails," which are identical with the fibres of Sharpey. Moreover, as Sharpey maintains, the ossification in membrane without the intervening stage of cartilage formation had been described by Nesbitt in 1736. Coincidently with the slow unfolding of the microscopic structure of bone, the experimental method was pursued by Stephen Hales, Nehemiah Grew, John Belchier, and John Hunter in this country, by Duhamel in Paris, and by Haller in Göttingen. Their methods consisted largely of actual measurements of growing bones and of the feeding of madder to experimental animals. Hales and Grew were activated by the search for vegetable processes in the development of the animal world. The madder experiments of Belchier and Hunter have been repeated on innumerable occasions, the most recent being the work of Prof. Brash,[2] of Birmingham, on the growth of the mandible. It is interesting to note how most modern investigators have failed to appreciate Hunter's description of the sites of deposition of the dye. Hunter[3] insisted on the fact that the whole of the bone was stained by madder, and that the depth of the staining was proportional to the rate of deposition and absorption of the earthy salts.

> "But in the full-grown state, it would appear from the circumstances of reddening a *whole* bone by feeding the animal with madder, that a bone, although completely formed, yet is changing its earth, and probably every other part. This effect, however, is much slower than in the growing bone. This would show that the madder does not act as a dye upon the earth which is already deposited in the bone, but only upon that matter which is every day deposited; and as there is a great deal more deposited in a young bone than in an old one in a given time, in the same proportion must it dye sooner than an old one. The new matter that is deposited in an old bone is to make up for the waste that is daily going on in it; but in a very old bone the waste is more than the repair."

This is the first clear expression of the fact that the calcium of the bones is not permanently fixed as a deposit account but can be brought into the circulation as a current account. The recent brilliant work of Collip[4] with parathyroid extract indicates the ease with which the extract can raise the blood calcium to abnormally high values by calling upon the calcium in the bones and muscles.

Grew, Duhamel, and the other botanists regarded bone as the product of the deeper layers of the periosteum, which they regarded as a "cambium" layer, by analogy with the actively proliferating zone of plants. Haller regarded bone as a product of the arteries, which could lay down bone anywhere. Hunter favoured this view, and Sir Arthur Keith[1] has recently attributed to the perithelial cells of the capillaries the power of conversion into osteoblasts. Goodsir, differing from Hunter, believed that the cartilage cells gave rise to "bone-forming corpuscles."

The present-day teaching of the formation of bone in membrane, in cartilage, and in the deep layer of the periosteum represents a consolidation of the views of Sharpey, Kölliker, and Virchow. The source of the osteoblast is, however, still a problem. Stump[5] traces the cartilage cell, the subperiosteal osteoblast, the endochondral osteoblast, the osteoclast, the endothelial cells of the growing capillaries, the primitive blood cells and the "hæmoblasts" to the same young connective tissue cells. This is an extreme statement of the monophyletic origin. Fell,[6] in a study of osteogenesis in the domestic fowl, claims, on the other hand, that the chondroblasts suffer a triple fate. They may give rise to osteoblasts, as described by Ranvier, Retterer, Macewen, and Van der Stricht, or they may give rise to the reticulum of the bone-marrow, or they may degenerate and disappear. Experiments on animals, such as those of Bast, Sullivan, and Geist[7] on the repair of fractured bones, show that the "cambium" layer of the periosteum, the osteogenetic cells lining the Haversian canals, and the cells of the endosteum are all active in the production of new bone. They found that the only site of formation of cartilage in the repair of bones was at the cut edge of the fibrous part of the periosteum. They saw fibrous tissue cells giving rise to cartilage cells. Carey and Zeit,[8] as a result of the study of the ossifying patella in the dog, emphasise the dual origin of the osteoblast, and depict both osteoblasts arising from the subendothelial mesenchyme cells accompanying the invading blood-vessels, and osteoblasts formed directly from the embryonic chondroblasts in the neighbourhood of the capillaries.

Nerve-supply of Bone.

The problem of the nerve-supply of bone has remained in abeyance. The innervation of the two tissues of the body which exhibit the greatest power of regeneration and repair, bone and its marrow, still awaits adequate description. Sir G. Thane, in Quain's Anatomy (tenth edition), mentions the fact that distinct nerves can be seen entering the nutrient foramina of the long bones. D. Goering[9] has studied the influence of the nervous system on bones and joints. She concludes that bone has a somatic and a sympathetic innervation by means of medullated and non-medullated nerve-fibres. Numerous investigators have found that trophic changes in bone follow nerve-section, such as loss of size and weight, diminution of inorganic material, and, in growing animals, defective development. Numerous observations have been recorded upon the influence in bone of nerve lesions and diseases in man. Here again, especially in leprosy, regressive changes seem to be the rule. In general, lesions of mixed nerves produce more bony changes than those of purely motor nerves, and irritative lesions of sensory nerves seem to be the most potent, as in leprosy. Goering concludes, on clinical grounds, that there are special trophic fibres of sympathetic origin passing to bones, with corresponding spinal centres. A general controlling centre, so it is claimed, is situated in the brain in the region of the floor of the third ventricle. It is obvious that there is much room for anatomical and clinical research in this field, and that the bony changes of anterior poliomyelitis and tabes dorsalis offer abundant material.

Problem of Calcium Metabolism.

The vast literature relating to bone formation was admirably summarised by Gideon Wells[10] in the Harvey lecture of 1911. Since that date biochemistry and the intensive study of the vitamins have revealed the complexity of the whole problem of calcium metabolism. Wells stated that the questions to be answered are:—

1. Why is calcium deposited in the tissues at all?
2. Why is it deposited in some tissues and not in others?
3. How is the calcium carried in the blood?
4. How is it held in the tissues where deposited?
5. Why is the composition of calcified deposits so constant, qualitatively and quantitatively?
6. What are the causes of rickets and osteomalacia?

These questions still await concise answers. The first question involves the whole problem of senescence and death. Calcification occurs not only in certain cartilages but also in tumours, such as fibroids and granulomata, in the meninges, and in tendons, ligaments, and arteries. The second question brings to mind the fact that the tissues which undergo calcification in senescence are the tissues which afford examples of vegetative reproduction, with or without mitotic division of nuclei, in relatively bloodless areas. Cartilage, which most readily undergoes calcification, is a tissue in which the cells live by the imbibition of tissue juice, removed from an active blood-supply. There is undoubtedly a limit to the size of the mass of cartilage which any animal can grow, just as there is a limit to the size of a granuloma. When the limit of growth is reached certain of the cells degenerate and the matrix calcifies or caseates. Thus in cartilage proliferation, degeneration and calcification are closely related to the vegetative processes of proliferation without specialisation of function and without differentiation of structure, leading to old age and death of the tissue. On the other hand, bone formation is an active process, distinct from calcification. It occurs in the presence of a rich blood-supply and is accompanied by differentiation of the primitive cells for function, as distinct from mere proliferation. In short, bone is a live tissue, actively growing or functioning in an area richly endowed with blood. Calcified cartilage is so senescent as to be virtually a dead tissue in an area relatively poor in blood-supply.

The question of the carriage of calcium in the blood has been attacked with great vigour by the chemist. Howland, Shipley, and Marriott and Kramer [11] have stated that bone normally contains bicalcium phosphate, that different bones of the same individual have the same inorganic percentage, that the ratio of calcium phosphate to calcium carbonate is greater in normal than in rachitic bones, and, further, that the bone contains the phosphate and carbonate of calcium in the same proportion as the serum. R. Robison [12] has disagreed with these views and has emphasised the significance of the hexose phosphoric esters. He states that the osteoblasts and the hypertrophic cartilage cells of the growing animal secrete an active phosphatase which, by hydrolysing the phosphoric esters of the blood, brings about a local increase of the tricalcium phosphate concentration. This concentration exceeds the solubility product of the salt and leads to its deposition in the ossifying zone. Howland and his co-workers do not favour simple precipitation as the explanation, but regard the process as a chemico-physical one, depending on the activity of the living tissue in a medium in which the concentration of calcium and phosphate in the serum and tissue juice exceed a certain minimum value. J. B. Collip [4] in Canada, and C. P. Stewart and J. H. Percival [13] in this country, have dealt in particular with the changes in serum calcium under administration of Collip's parathyroid hormone. The diffusible calcium is markedly increased thereby. These experiments indicate the ease with which calcium passes into the blood from bone and other tissues, and this is a brilliant confirmation of Hunter's precocious statement about the continuous absorption and deposition of alkaline earths in old bone as well as in young bone.

Several attempts have been made to imitate in colloidal solutions the actual deposition of tricalcium phosphate and calcium carbonate. Barillé [14] in France and J. C. Watt [15] in Canada have come to the conclusion that the salts in bone are deposited by the activity of the osteoblasts as a secretory phenomenon. Crétin,[16] in particular, has contributed much to our knowledge of the staining reaction of bone and of the possible conditions of deposition of the calcium salts. He regards the actual areas of muscular attachment to be of great significance in determining cartilage formation and ossification. The sterno-mastoid and trapezius muscles in relation to the clavicle and the occipital bone are differentiated before the cartilage or bone appears. The point of cartilage formation and of bone formation is always related to the muscular attachment. The transportation of phosphorus in combination with alkali metals converts the primitive tissue into cartilage by producing a modification in the albumenoids of the matrix. Whereas cartilage is rich in sodium, growth ceases when calcium disturbs the equilibrium between phosphate on the one hand and sodium and potassium on the other. Calcium carbonate is now precipitated, redissolved in the presence of alkalies, and then reprecipitated by phosphate in the form of basic phosphate or phosphocarbonate.

Tissue Culture Experiments.

The results of tissue culture experiments have so far been disappointing. A. Carrel and M. T. Burrows [17] cultivated conjugal cartilage as early as 1910, but the first detailed experiments were those of A. Fischer [18] in 1922. He cultivated the cartilage cells from the sclera of the chick embryo “in vitro,” and found that the cells would not grow in the substance but would grow on the surface of a clot of plasma. In the implant the hyaline substance liquefies, the cells migrate, increase in size, and continue to live. No division of the cells was seen. T. S. Strangeways [19] succeeded in producing multiplication of the cartilage cells in vitro, with typical mitoses. Policard and Boucharlat [20] implanted periosteum and perichondrium of chicks, but in vitro they gave rise to connective tissue cells without the formation of cartilage or bone. A. O. Wjerinski [21] reports the same results in vitro, though a homoplastic transplant in vivo led to strong mitotic multiplication of the cells of the periosteum and actual conversion into osteoblasts. Thus, so far, osteoblasts have not been grown or propagated in vitro by the technique of tissue culture. This suggests that the osteoblast is a purposively differentiated cell which may easily regress into a fibroblast, but will only redifferentiate in the presence of the blood-borne exudate of a living capillary.

The nerve cell of the young embryo has been grown in tissue culture, but the growth has been localised almost entirely in the axone—i.e., in the part of the cell which was shown capable of growth in the adult by Waller's classical experiments on nerve regeneration. The osteoblast, as Burrows [22] has pointed out for the fully matured lymphocyte, polymorphonuclear leucocyte, and many other mononuclear cells, will not grow in a tissue culture. Neither the nerve cell nor the osteoblast can be propagated. Thus these cells seem to exhibit an extreme degree of differentiation.

R. G. Harrison,[23] in 1914, pointed out that cells will not grow in tissue cultures in clotted plasma unless some form of support is afforded, such as the surface of the cover-glass, the surface of the fluid film, or a framework of spider-web, silk gauze, or cotton-thread. In cultures in which the tissue floats free in a fluid medium no outgrowth occurs and the cell succumbs. This phenomenon whereby a cell in the free rounded stage, devoid of support, is unable to grow was described by Leo Loeb and Fleischer [24] under the name of stereotropism. It involves a most fundamental conception of a skeletal support for the cell, and may account for the failure to grow osteoblasts and fully differentiated blood cells such as lymphocytes. Kidney and liver are grown with ease because of their associated connective tissue stroma. Cartilage cells die when they round up near the epiphysis. Osteoblasts apparently require the support of a connective tissue stroma and the adequate supply of blood-borne substances such as vitamin A and ergusia. Only those animals which have a blood vascular system and a cœlom are able to produce an active osteoblast.

Bone Pathology.

The pathology of bone, like the pathology of the blood-vessels, has been so obscured by diverse classifications and a multitude of strange names that certain simple facts escape observation. Chondrodystrophies, osteochondrites, and osteites have been subdivided without end, and dysostoses, aclasias, and dysclasias have been added thereto. Vrolik's term of “ osteogenesis imperfecta ” is one of the few safe terms in the pathology of growing bone. H. A. Harris's [25] tentative scheme, as a simple working basis for the analysis of bone growth, serves also as a basis for the interpretation of bone pathology. He states that cartilage grows vegetatively by the imbibition of tissue juice in much the same way as bacteria, yeasts, tumour cells, and granulomata. This vegetative proliferation of the cell is largely under the control of the water-soluble vitamins and of those substances which workers in the realm of tissue culture have designed as “ archusia ” (M. T. Burrows)[26] or “ trephones ” (A. Carell).[27] The process of proliferation of the undifferentiated cartilage cell is limited by the size of the mass and by the adequacy of nutrition. When the mass of cartilage reaches a certain limit, as in the case of a granuloma, the cells within the mass become senescent, degenerate, and gradually pass into a resting stage which in many cases leads to death. This process of degeneration is accompanied by calcification of the matrix, and is comparable to the phenomenon of caseation and calcification in a tubercle, gumma, or fibroid, or to hyalinisation and the formation of cell nests in a stage of cartilage formation had been described by Nesbitt in 1736. Coincidently with the slow unfolding of the microscopic structure of bone, the experimental method was pursued by Stephen Hales, Nehemiah Grew, John Belchier, and John Hunter in this country, by Duhamel in Paris, and by Haller in Göttingen. Their methods consisted largely of actual measurements of growing bones and of the feeding of madder to experimental animals. Hales and Grew were activated by the search for vegetable processes in the development of the animal world. The madder experiments of Belchier and Hunter have been repeated on innumerable occasions, the most recent being the work of Prof. Brash,[2] of Birmingham, on the growth of the mandible. It is interesting to note how most modern investigators have failed to appreciate Hunter's description of the sites of deposition of the dye. Hunter[3] insisted on the fact that the whole of the bone was stained by madder, and that the depth of the staining was proportional to the rate of deposition and absorption of the earthy salts.

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These questions still await concise answers. The first question involves the whole problem of senescence and death. Calcification occurs not only in certain cartilages but also in tumours, such as fibroids and granulomata, in the meninges, and in tendons, ligaments, and arteries. The second question brings to mind the fact that the tissues which undergo calcification in senescence are the tissues which afford examples of vegetative reproduction, with or without mitotic division of nuclei, in relatively bloodless areas. Cartilage, which most readily undergoes calcification, is a tissue in which the cells live by the imbibition of tissue juice, removed from an active blood-supply. There is undoubtedly a limit to the size of the mass of cartilage which any animal can grow, just as there is a limit to the size of a granuloma. When the limit of growth is reached certain of the cells degenerate and the matrix calcifies or caseates. Thus in cartilage proliferation, degeneration and calcification are closely related to the vegetative processes of proliferation without specialisation of function and without differentiation of structure, leading to old age and death of the tissue. On the other hand, bone formation is an active process, distinct from calcification. It occurs in the presence of a rich blood-supply and is accompanied by differentiation of the primitive cells for function, as distinct persists in the molar teeth of the rat after eruption. The crown continues to increase in both dimensions; as much as 10 per cent. is added to its length and breadth during the first two years, and the growth takes place in the dentine. This startling observation compels us to regard dentine, like bone, as a tissue subject to prolonged growth, peculiarly susceptible to changes in the blood calcium, and revealing the same processes of absorption and deposition as bone. The rapid development of caries and the fragmentation of the enamel in pregnant and nursing mothers may be due to the inroad made on the calcium of the dentine and the resulting shrinkage.

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The onset is usually insidious, taking the form of a vague dyspepsia or abdominal discomfort which may be regarded lightly by the patient until the crisis arrives with a well-marked attack of intestinal obstruction. The commonest symptoms and signs are: (*a*) in the earlier quiet period—pain, flatulence, and meteorism or distension with gas, alteration in the motions such as constipation and diarrhœa, and occasionally a local tumour; (*b*) the urgent condition—signs of acute intestinal obstruction and of local or general peritoneal irritation. Most of the early signs are those of early intestinal obstruction and must be weighed carefully before being regarded as trivial.

Early Stages.

In the early stages a mild degree of obstruction is apt to be the only significant sign. Rarely a local tumour can be felt. A woman of 50 who had suffered from metrorrhagia for some years was brought up for examination. In addition to the enlarged nodular fibroid uterus there was a small mobile lump on the left of, and not definitely attached to, the uterus, but sufficiently close to lead to the conclusion that it was a very mobile subperitoneal fibroid. At operation the small lump proved to be a cancer of the sigmoid. The cæcum is the part where a cancerous tumour is most commonly noted early.

1. *The pain* tends to be intermittent and varies from abdominal discomfort to fairly severe colic as the obstruction becomes more advanced. It may have a relation to meals and is, in fact, one of the forms of dyspepsia. The time relation is not, however, constant, like that of peptic ulcer, and the associated flatulence renders it more likely to be confused with gall-bladder dyspepsia. In a great many instances the pain is not enough to make the patient seek advice before acute obstruction supervenes. More rarely there is pain of a different type in the vicinity of the growth, as in one case where there was a large growth of the cæcum simulating a renal tumour, but not reducible into the loin. In other patients spread of the growth from the splenic flexure along the lieno-renal ligament gave severe pain, which in one instance preceded any signs of obstruction by some weeks and drew attention to the kidney rather than the bowel. Localised pain from ulceration of, and peritonitis over, the distended cæcum is discussed later.

2. *Flatulence* is a word covering various conditions. It may refer to eructation of gas associated with pain or discomfort, or to a feeling of full[illegible] which is relieved by [illegible] tion with gurgling and tinkling noises known as borborygmi. Such noises and eructations are so commonly due to errors in diet, neurosis, &c., that unless they are of recent development and recur frequently, accompanied by pain which is relieved by the passage of gas, they have little significance.

carcinoma. Lastly, the propinquity of a rapidly growing capillary system in the bone-marrow brings into the region a new set of factors which lead to tissue differentiation as distinct from cell proliferation. The capillaries of the bone-marrow proceed to remove the dead calcified cartilage as they would proceed to remove any other foreign dead body, such as a caseated granuloma or a ligature. The cells of the calcified cartilage that are not quite dead, but rather in a resting or " spore " stage, respond to the approach of the blood capillaries by active amitotic division to form osteoblasts. Any primitive connective tissue cell in the vicinity of the actively proliferating capillary can give rise to osteoblasts, whether this cell be periosteal, perivascular, or reticular. This process of cell differentiation for function is in part attributable to the arrival in the area, via the blood stream, of fat-soluble blood-borne substances. These fat-soluble, blood-borne substances correspond to the " ergusia " or differentiating, energy-producing substance of Burrows, and to vitamin A proper. The osteoblasts are cells designed for work, not for proliferation, and a failure of ergusia or vitamin A leads to the formation of imperfectly differentiated osteoblasts. The degree of differentiation may be so low that the osteoblast is little more than a fibroblast; it may be more advanced, so that the cells deserve the name of " osteoidoblast," but only in the presence of an adequate supply of the blood-borne vitamin A does one see the fully differentiated osteoblast with deeply staining nucleus and numerous basophilic granules in the cytoplasm. This conception of the vegetative proliferative process in cartilage, in contradistinction to the differentiating and functional process in bone, is not entirely new. Its formulation in terms of archusia and ergusia on the one hand, or in terms of water-soluble and fat-soluble vitamins on the other hand, is but an experimental and clinical statement of a long-established teleological fact. Richard Owen,[28] when Curator of the Royal College of Surgeons of England, said, as far back as 1843 :—

> " Organic forms result from the antagonistic working of two principles, of which one brings about a vegetative repetition of structure, while the other, a teleological principle, shapes the living thing to its functions. . . . In every species these two forces are at work, and the extent to which the general polarising or ' vegetative repetition force ' is subdued by the teleological is an index of the grade of the species."

Evolution is measured by the extent of the triumph of ergusia and the fat-soluble vitamins over archusia and the water-soluble vitamins.

The term metastatic calcification was applied by Virchow to the occurrence of deposits of calcium salts in abnormal sites. There is hardly a tissue in the body which does not present numerous examples of abnormal calcification, from ganglion cells and skin on the one hand, to kidney, liver, lungs, and gastric mucosa on the other. Most of the cases of calcification occur in an area of senile or necrosed tissue, with a poor blood-supply and a slow lymph stream. There are, however, three marked exceptions, for calcification has been repeatedly reported in the lungs, kidneys, and gastric mucous membrane. These three areas are the sites of excretion or secretion of acid substances, and the tendency to calcification in these areas may be an expression of this fact. Cartilage, when calcifying, stains deeply with basophilic dyes, and has an acid reaction. Wells[29] has stated that the well-known tendency of muscle-fibres to calcify in the vicinity of recent wounds, including laparotomy wounds, may be due to the precipitation of calcium salts by lactic acid, set free by the injury to the muscle-fibres during the process of degeneration. The question whether a site of calcification shall also become a site of bone formation is apparently a question of blood-supply. Tendons, ligaments, the media of arteries and caseating granulomata rarely produce true bone, but muscle, kidney, lung, suprarenal, and tonsil frequently do, by reason of the association of primitive connective tissue cells with a rich capillary network. Cushing and Weed,[30] in their experimental studies on the cerebro-spinal fluid of cats, observed numerous instances of calcification and ossification of the arachnoid membrane. Calcification occurred in non-vascular areas, for the nutrition of the arachnoid is obtained through the cerebro-spinal fluid rather than through the blood stream. On the other hand, every case of true bone formation was vascularised and could be attributed to the proliferation of mesothelial cells in a vascularised area, as distinct from the calcification of aged cells in an avascular area. In the aged cadaver of the dissecting-room, calcification of the membranes, both dura and arachnoid, is common. True bone formation, on the other hand, is rare.

For a considerable time it was thought that the secret of calcification would be found in the formation of calcium soaps with fatty acids, for the early pathologists had described calcification by soap formation in degenerating lipomata as early as 1850. The absence of any appreciable amount of calcium soaps from areas of normal calcification has negatived this idea, and the presence of large quantities of calcium soaps in certain stages of the digestion of fat without associated calcification is also against the theory. We seem to be confronted with the need for a new chemical concept. The hydrogen-ion concentration and the salt content must be known, not only for the arterial and venous streams but also for the contents of the lymphatics, for the tissue juice, and for the interior of the cell. The high percentage of calcium which can be absorbed in a cartilage designed for later calcification was shown by Wells.[10] He showed that pieces of epiphysial cartilage, tracheal cartilage, and costal cartilage absorb decreasing amounts of calcium salts, irrespective of whether the cells in the transplant be alive or dead. Moreover, decalcified bone-grafts are known to be less efficient than normal bone-grafts, so that a preliminary calcification or power of calcium absorption in the tissue seems to be advantageous for subsequent ossification. Pathological ossification, no less than normal ossification, seems to require preliminary calcification of the cartilage or of the necrosed tissue.

Since no chemical ion or soap in cartilage can be proved to be an adequate agent in producing the deposition of calcium phosphate and carbonate, it is interesting to note that Jan Wolf[31] has returned to the problem of chondroitin-sulphuric acid. This substance is a normal constituent of cartilage; it is increased in calcifying cartilage; it occurs in the amyloid deposits of the spleen, liver, and arteries; its calcium salt is very soluble. Jan Wolf has shown that the small veins draining the costal cartilage contain a measurable amount of chondroitin-sulphuric acid, and that this can be stained in situ by mucicarmin or basophilic stains. The acid is not found in the arteries. This suggests that the continuous removal of chondroitin-sulphuric acid from the matrix of a cartilage is necessary to preserve it from calcification. As yet no one has studied the effects on the solubility product of this acid or its calcium salt in the presence of other ions. Even as long ago as 1891, Schmiedeberg[32] suggested that one of the functions of cartilage was the production of chondroitin-sulphuric acid and that this acid served as a mordant and possibly as a regulator of the processes of nutrition in other tissues. A chemical study of cartilage from this point of view may throw some light upon the metabolism of mucin, which hitherto has been unsolved.

Dentine and the Odontoblast.

Closely associated with the problem of the osteoblast and bone is the problem of the odontoblast and dentine. The metabolic processes involved are closely related, and the pathological processes are parallel in craniotabes, in dysostosis cleidocranialis, in osteomalacia, and in experimental rickets. The problem has been discussed recently by Mrs. Mellanby,[33] W. Fish,[34] and D. Stewart,[35] and attention must be drawn to the disturbing evidence adduced by Donaldson and French,[36] who claim that growth persists in the molar teeth of the rat after eruption. The crown continues to increase in both dimensions; as much as 10 per cent. is added to its length and breadth during the first two years, and the growth takes place in the dentine. This startling observation compels us to regard dentine, like bone, as a tissue subject to prolonged growth, peculiarly susceptible to changes in the blood calcium, and revealing the same processes of absorption and deposition as bone. The rapid development of caries and the fragmentation of the enamel in pregnant and nursing mothers may be due to the inroad made on the calcium of the dentine and the resulting shrinkage.

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Early Stages.

In the early stages a mild degree of obstruction is apt to be the only significant sign. Rarely a local tumour can be felt. A woman of 50 who had suffered from metrorrhagia for some years was brought up for examination. In addition to the enlarged nodular fibroid uterus there was a small mobile lump on the left of, and not definitely attached to, the uterus, but sufficiently close to lead to the conclusion that it was a very mobile subperitoneal fibroid. At operation the small lump proved to be a cancer of the sigmoid. The cæcum is the part where a cancerous tumour is most commonly noted early.

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Careful inquiry into the smaller happenings of a patient's abdomen will often be helpful. Meteorism or considerable distension of the abdomen with gas may be regarded as the acme of flatulence; it is hardly an early symptom but is evidence that intestinal obstruction is already well developed and that the case has passed into stage (*b*).

3. *Irregular action of the bowels*, if of recent origin in a middle-aged or elderly patient who has previously been normal, is one of the most suggestive symptoms. Less frequent, smaller, and perhaps thin and tape-like motions suggest an obstructive growth low down in the large intestine. Obstruction higher up, where the motion is soft or liquid, will not have the same effect in causing constipation and alteration in the shape of the motions. Diarrhœa is less frequent and is usually associated with constipation, though it may be the initial symptom. Two quite different conditions are classed together as diarrhœa.

(*a*) The first is the liquefaction of fæces above an obstruction which has perhaps become temporarily blocked with a scybalous mass, the pouring out of secretion by the mucosa irritated by the retained fæces, and, still more, the inability of the mucosa to perform its normal function of extracting water from the fæcal porridge. The result is a great mass of peasoup-like material above the stenosed part. The temporary block gives way and the flood of liquid fæces pours down as diarrhœa or, if the dam does not yield naturally, persists until the surgeon lets out many pints of liquid fæces through a Paul's tube to relieve acute obstruction.

(*b*) The second is the irritation of a fungating growth by the passage of fæces which causes an outpouring of mucus, pus, sloughs, and perhaps blood, and irritates the bowel below, causing tenesmus and small, frequent, slimy stools. Diarrhœa of this type is a special feature of cancer of the lower part of the large gut, especially the rectum, and is common in the early morning. In the former class we find large intermittent stools of liquid fæces, and in the latter small, frequent stools with plenty of mucus, perhaps blood and occasionally sloughs.

A palpable tumour is not common, and when present is, in my experience, of evil significance. The larger number of cases are those of annular stricture, which can only be felt when the abdomen is opened. A cancer is most often palpable in the cæcal region. Unfortunately, the tumours that can be palpated are apt to be secondaries in the glands, mesentery, and omentum, and indicate that the stage for radical removal has passed.

To sum up, the only early signs of cancer of the bowel, except tumour, which is uncommon, are those of intestinal obstruction. The difficulty consists in distinguishing in time obstruction from other abdominal conditions of less serious or, at any rate, of less urgent import.

Later Stages.

The signs at this period are those suggesting what is commonly known as the "acute abdomen," and are of two types, (*a*) the obstructive, and (*b*) the peritonitic, though a combination is not uncommon.

The signs of acute obstruction hardly need repetition here; the severe colicky pain, the rising pulse, the vomit turning from green to brown, then acquiring a foul odour and finally consisting of liquid fæces, and the inability to pass flatus form a very definite picture. This is the class of case where true fæcal vomiting is best seen; it simply denotes that the obstruction is low in the bowel. Visible peristalsis and marked meteorism, without tenderness or rigidity, complete the picture.

The less frequent but more obviously acute type is where the bowel above the obstruction is so distended that it has become ulcerated with inflammation spreading to its peritoneal coat. It may be gangrenous, or perforation may have taken place. The abdomen will then show marked tenderness and rigidity, which may be general where leaking of fæces through a perforation has taken place, or localised, especially in the right iliac fossa, because the cæcum is the place of maximum distension where gangrene and perforation most commonly occur. This last type of case gives a picture closely resembling acute appendicitis and has caused difficulty in diagnosis.

X Rays in Diagnosis.

Since almost the only signs are those of oncoming intestinal obstruction, it behoves us to get any help we can in distinguishing this from other varieties of "dyspepsia." Careful following of an opaque meal downwards and, still better, of an opaque enema upwards with the fluorescent screen, is of great help in early and doubtful cases, but more often results in proving a negative and saving an exploratory laparotomy than in finding and locating an intestinal growth. Most commonly, in my experience, by the time the patient and doctor realise that anything serious is the matter, it is sufficiently obvious that operation is urgent and that X ray examination will only take up time which might be better employed. There can be no doubt, however, that if this means of investigation were used more frequently for patients with obscure abdominal symptoms, a good many cases would be diagnosed with sufficient probability to warrant operation at an earlier period.

Complications.

These are, unfortunately, only too frequent, and they may be :—

1. Direct sequelæ of the growth: (*a*) Spread of the cancer to omentum, glands, peritoneum, or liver, rendering radical removal impossible. (*b*) Distension of the bowel above a constricting growth, ending in localised ulceration, gangrene, and perforation, and leading to local or generalised peritonitis.

2. Association with totally distinct diseases such as appendicitis, suppurating ovarian cyst, or fibroids of the uterus, any of which may render radical removal of the growth much more difficult.

Treatment.

Out of 69 cases preliminary drainage by colostomy (including cæcostomy) or lateral anastomosis was done in 57; in the other 12 the operation was primary excision and anastomosis. Of the 43 cases which survived colostomy or anastomosis excision of the growth was done in 24, and 16 recovered. As far as possible the rule was followed of not resecting at the primary operation when any obstruction was present. In some special circumstances this rule was broken, and not always with bad results. Taking it all round, patients did far better after secondary than primary excision, the mortality being 30 per cent. as against nearly 60 per cent. There is a great temptation to try to get the matter finished with as few operations as possible, especially in aged patients, but experience shows that people over 70 stand the extra time in bed, needed for a second and third operation (excision and closure of colostomy), quite well. Colostomy, though a relatively minor operation, has quite a sufficiently high mortality; in this series it was 20 per cent. This may seem high, but it is partly caused by complications. For instance, a middle-aged woman was admitted to hospital with well-marked signs of appendicitis. A large, red, swollen appendix surrounded with lymph was removed and the abdomen closed. The patient made a good recovery for 14 days and was about to get up when she was suddenly seized with severe abdominal pain and rigidity with collapse. Immediate laparotomy revealed thrombosis of the inferior mesenteric vessels, early gangrene of the sigmoid and descending colon, and a small annular cancer of the sigmoid. Whether the appendicitis was a pure coincidence or a sequel to septic absorption from the ulcerated growth, as well as a source for thrombosis, is a matter for conjecture.

In several other cases the cæcum has been gangrenous or perforated; not all these cases succumbed, but those who survive are fortunate. In another patient a suppurating ovarian cyst rendered the preliminary colostomy and excision difficult and presumably inadequate, as recurrence took place. About a year later another inflamed ovarian cyst on the opposite side further complicated the condition.

Primary Excision of Cancer.

Cases in which primary excision seems enticing are:—

(*a*) Those in which no obstruction is present—i.e., those in which a palpable tumour is the leading sign, especially growths of the cæcum.

(*b*) Growths of the cæcum and ascending colon, because of the technical difficulties of an enterostomy in or above the cæcum followed by excision in the vicinity of such a fæcal fistula.

(*c*) Where sepsis, peritonitis, and possibly abscess about the growth without much obstruction lead the surgeon to think that if the cases recover from colostomy and drainage of pus the resulting adhesions will make removal of the growth later on impossible. My impression is that cases of the last group are such bad operative risks that as little as possible should be done at first, provided that good drainage be established. For example, after draining an abdomen the lower part of which was full of fæculent pus from the bursting of an over-distended cæcum, and making a cæcostomy, I was able three months later to remove a cancer of the transverse colon with comparative ease and success. One can afford to wait quite a considerable time after establishing bowel drainage.

Cases of group (*b*) have most often tempted me to a primary excision, and though the results are poor they are no worse than those of secondary resection following anastomosis or drainage by enterostomy. The mortality either way is about 50 per cent. Where there is no obstruction there seems no reason why primary resection should not be done; nevertheless, we shall probably get better results by preliminary drainage.

Sites for Temporary Colostomy.

There are three sites where the colon has a suitably long mesocolon—viz., the sigmoid, the transverse colon, and the cæcum. The sigmoid is seldom available for growths above the rectum, and it is surprising how often it is too short to bring up to the surface. In some cases the sigmoid loop is long enough to use the upper part for a left inguinal colostomy for cancer of the lower sigmoid; more often, however, the colostomy must be made in the transverse colon or cæcum. The cæcum is the place most generally suitable and its great advantage is accessibility. In the course of operation for intestinal obstruction the cæcum is the first thing to look for, and therefore by the time one has decided on the local condition and diagnosis (provisional or complete) it is ready to hand and can readily be brought out through a small grid-iron incision in the right iliac fossa, well away from the future field of operation in the middle line. Moreover, the fæces here are liquid and escape readily, so that the Paul's tube does not get blocked with scybalæ, as may happen lower down. The disadvantages are more apparent than real. (1) The cæcostomy is not an artificial anus but a fæcal fistula—i.e., the current of fæces is tapped but not entirely diverted so that we cannot avoid letting fæces pass the growth, and operation later cannot be rendered aseptic. As a matter of fact, even if the fæcal stream be diverted, it is often impossible to get all the fæcal masses out of the bowel, especially as they are often below the growth. (2) The fluidity of the fæces is a great advantage for a temporary colostomy, but owing to irritation of the skin is a serious drawback for one which is intended to be permanent. Therefore one must try to make sure that the growth is removable before doing a cæcostomy. In urgent cases this may be too difficult and dangerous, and, of course, it is possible to make a permanent colostomy lower down after the obstruction is relieved and close the cæcostomy. To perform three operations in a patient condemned to death is not a very satisfactory procedure, but it may be unavoidable.

The transverse colon has the disadvantages (1) that it may be pushed up by the distended guts and may be difficult to bring to the surface; (2) that the attachment of the omentum renders it hard to make a neat colostomy opening, although when there is time the bowel can be freed from the omentum; (3) that it comes up most easily in the mid-line, where colostomy is rather in the way of further proceedings. The transverse colon is more useful for a permanent colostomy.

Where the cancer is in a long loose loop of colon the loop and growth may be simply pulled up outside the abdomen and a colostomy made above the growth. A few days later, when the obstruction has subsided, the loop of bowel with the growth can be resected without anæsthetic close to the abdominal wall. Still later the two ends of colon can be freed, sutured end to end, and replaced. The last operation is practically extraperitoneal, as the adhesions about the abdominal opening usually stretch sufficiently to allow of manipulation and suturing without opening the peritoneum. This method of Greig-Smith is the one for debilitated subjects, but is only suitable in a few instances, especially for growths of the sigmoid. The disadvantage is that, although a good length of colon can be removed, the amount of mesocolon and glands available may be inadequate to make the resection sufficiently radical. Usually 10 to 20 days were allowed to elapse after the preliminary colostomy before removal of the cancer was attempted, but occasionally, owing to complications, as much as three months passed with quite successful results.

Resection of the Cancer.

The work of Jameson and Dobson has given us a standard of the amount of bowel, mesentery, and glands that should be removed if possible for growths of the various parts of the colon, and I have had this standard in mind in operating on these cases. It happens, however, fairly often that the condition of the patient or the complications involving the growth render it impossible for a classical excision to be carried out in its entirety. Fortunately, these growths are mostly of a sclerosing, slow-growing type with late secondary spread, and what seems on anatomical and pathological grounds an inadequate operation often proves quite successful. End-to-end anastomosis was most frequently employed and occasionally end to side. This saves material where there is not too much length to spare and has, in my experience, given better results than the lateral method. If a cæcostomy had not been made at a previous operation one was always provided when resection and anastomosis was done, to act as a safety-valve for flatus and to prevent tension on the suture line.

Table of Operations and Results.

—	Colostomy.		Anastomosis.		Primary resection.		Secondary resection following—			
							(*a*) colostomy.		(*b*) anastomosis.	
	L.	D.	L.	D.	L.	D.	L.	D.	L.	D.
Small intestine ..	—	—	1	0	1	0	—	—	—	—
Cæcum and ascending colon	1	0	2	3	2	4	0	1	1	1
Transverse colon ..	3	1	—	—	—	—	2	0	—	—
Splenic flexure and descending colon	11	3	3	1	—	2	5	4	1	0
Sigmoid	21	5	1	—	3	1	7	2	—	—
Total ..	36	9	7	4	6	7	14	7	2	1

L. = Lived. D. = Died.

Conclusions.

About half the cases come to hand at a sufficiently early stage to warrant an attempt at radical removal. Few cases are thought to need surgical advice until

Careful inquiry into the smaller happenings of a patient's abdomen will often be helpful. Meteorism or considerable distension of the abdomen with gas may be regarded as the acme of flatulence; it is hardly an early symptom but is evidence that intestinal obstruction is already well developed and that the case has passed into stage (*b*).

3. *Irregular action of the bowels*, if of recent origin in a middle-aged or elderly patient who has previously been normal, is one of the most suggestive symptoms. Less frequent, smaller, and perhaps thin and tape-like motions suggest an obstructive growth low down in the large intestine. Obstruction higher up, where the motion is soft or liquid, will not have the same effect in causing constipation and alteration in the shape of the motions. Diarrhœa is less frequent and is usually associated with constipation, though it may be the initial symptom. Two quite different conditions are classed together as diarrhœa.

(*a*) The first is the liquefaction of fæces above an obstruction which has perhaps become temporarily blocked with a scybalous mass, the pouring out of secretion by the mucosa irritated by the retained fæces, and, still more, the inability of the mucosa to perform its normal function of extracting water from the fæcal porridge. The result is a great mass of peasoup-like material above the stenosed part. The temporary block gives way and the flood of liquid fæces pours down as diarrhœa or, if the dam does not yield naturally, persists until the surgeon lets out many pints of liquid fæces through a Paul's tube to relieve acute obstruction.

(*b*) The second is the irritation of a fungating growth by the passage of fæces which causes an outpouring of mucus, pus, sloughs, and perhaps blood, and irritates the bowel below, causing tenesmus and small, frequent, slimy stools. Diarrhœa of this type is a special feature of cancer of the lower part of the large gut, especially the rectum, and is common in the early morning. In the former class we find large intermittent stools of liquid fæces, and in the latter small, frequent stools with plenty of mucus, perhaps blood and occasionally sloughs.

A palpable tumour is not common, and when present is, in my experience, of evil significance. The larger number of cases are those of annular stricture, which can only be felt when the abdomen is opened. A cancer is most often palpable in the cæcal region. Unfortunately, the tumours that can be palpated are apt to be secondaries in the glands, mesentery, and omentum, and indicate that the stage for radical removal has passed.

To sum up, the only early signs of cancer of the bowel, except tumour, which is uncommon, are those of intestinal obstruction. The difficulty consists in distinguishing in time obstruction from other abdominal conditions of less serious or, at any rate, of less urgent import.

Later Stages.

The signs at this period are those suggesting what is commonly known as the "acute abdomen," and are of two types, (*a*) the obstructive, and (*b*) the peritonitic, though a combination is not uncommon.

The signs of acute obstruction hardly need repetition here; the severe colicky pain, the rising pulse, the vomit turning from green to brown, then acquiring a foul odour and finally consisting of liquid fæces, and the inability to pass flatus form a very definite picture. This is the class of case where true fæcal vomiting is best seen; it simply denotes that the obstruction is low in the bowel. Visible peristalsis and marked meteorism, without tenderness or rigidity, complete the picture.

The less frequent but more obviously acute type is where the bowel above the obstruction is so distended that it has become ulcerated with inflammation spreading to its peritoneal coat. It may be gangrenous, or perforation may have taken place. The abdomen will then show marked tenderness and rigidity, which may be general where leaking of fæces through a perforation has taken place, or localised, especially in the right iliac fossa, because the cæcum is the place of maximum distension where gangrene and perforation most commonly occur. This last type of case gives a picture closely resembling acute appendicitis and has caused difficulty in diagnosis.

X Rays in Diagnosis.

Since almost the only signs are those of oncoming intestinal obstruction, it behoves us to get any help we can in distinguishing this from other varieties of "dyspepsia." Careful following of an opaque meal downwards and, still better, of an opaque enema upwards with the fluorescent screen, is of great help in early and doubtful cases, but more often results in proving a negative and saving an exploratory laparotomy than in finding and locating an intestinal growth. Most commonly, in my experience, by the time the patient and doctor realise that anything serious is the matter, it is sufficiently obvious that operation is urgent and that X ray examination will only take up time which might be better employed. There can be no doubt, however, that if this means of investigation were used more frequently for patients with obscure abdominal symptoms, a good many cases would be diagnosed with sufficient probability to warrant operation at an earlier period.

Complications.

These are, unfortunately, only too frequent, and they may be:—

1. Direct sequelæ of the growth: (*a*) Spread of the cancer to omentum, glands, peritoneum, or liver, rendering radical removal impossible. (*b*) Distension of the bowel above a constricting growth, ending in localised ulceration, gangrene, and perforation, and leading to local or generalised peritonitis.

2. Association with totally distinct diseases such as appendicitis, suppurating ovarian cyst, or fibroids of the uterus, any of which may render radical removal of the growth much more difficult.

Treatment.

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In several other cases the cæcum has been gangrenous or perforated: not all these cases succumbed, but those who survive are fortunate. In another patient a suppurating ovarian cyst rendered the preliminary colostomy and excision difficult and

Plasmoquine-compound.

Subsequently Schulemann and Memmi showed that the therapeutic action of plasmoquine was greatly enhanced by the addition of quinine, and that the specific plasmoquine cyanosis was thereby avoided. In other words, the therapeutic actions of plasmoquine and quinine are antagonistic. It was found, moreover, that the addition of small quantities of quinine greatly increased its parasitotropic action upon subtertian infections and that the clinical results were, as a rule, superior to those of plasmoquine alone. Schulemann and his fellow workers have shown that one-tenth of the daily amount of plasmoquine taken is excreted in the urine. The presence of the drug in the urine can be ascertained by chloranil, which gives an intense blue colour with plasmoquine, but not with quinine.

The combination of quinine sulphate with plasmoquine is now known as "plasmoquine-compound." It is put up in tablets of 0·01 g. (gr. 1/6) plasmoquine with 0·125 g. (gr. 2) quinine sulphate. The following scheme of dosage and treatment is the one I generally advise:—

For Benign Tertian and Quartan Malaria.

1st week, 7 days, 2 tablets plasmoquine-compound three times daily (0·06 g. (gr. 1): plasmoquine plus 0·75 g. (grs. 12) quinine three times daily).

Treatment should extend over a further 44 days, composed of four separate weeks' treatment (making five weeks in all) of 12 tablets of plasmoquine-compound daily with four days' interval between each week. It is necessary to follow this scheme closely in order to prevent relapses.

In subtertian malaria it has been found advisable to alter the periods during which the drug is administered. The first period should be one of five days followed by a four days' break, and the subsequent five courses of administration should be five days each, instead of seven, as given in the above table. It is necessary to be explicit about the dosage of plasmoquine-compound, as confusion is apt to arise on this point. Recently the size of the individual tablet has been altered to contain twice the amount formerly dispensed. Up to a month ago each tablet contained 0·005 g. plasmoquine and 0·0625 g. quinine.

In a recent communication I have been able to show that plasmoquine-compound has a striking effect upon the gametocytes of both subtertian and benign tertian malaria. Disintegration of crescents takes place after the exhibition of 8 tablets of plasmoquine compound (i.e., 0·08 g. plasmoquine plus 1·0 g. quinine), while with pure quinine these crescents sometimes persist in the circulation for a month.

Recent Experiences in the Treatment of Malaria with Plasmoquine-compound.

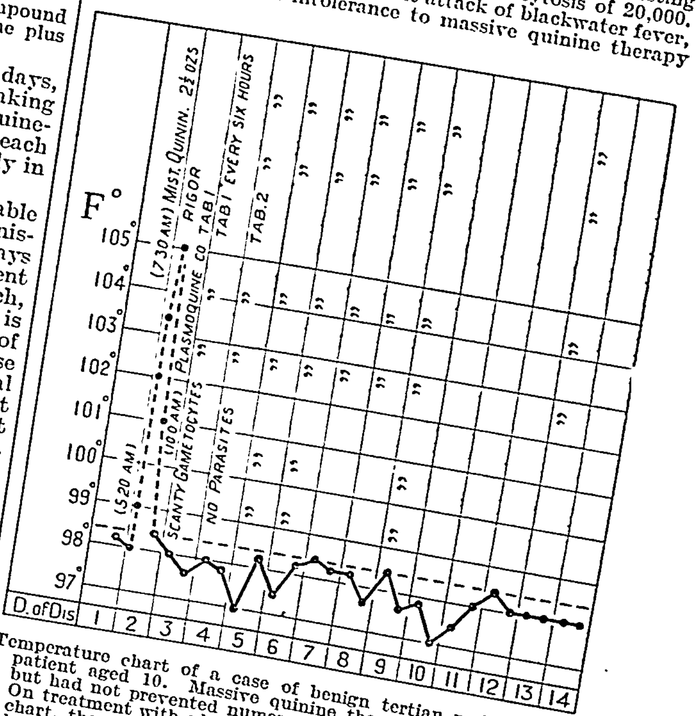
During the year 1927 and the early portion of 1928 I have discontinued the use of plasmoquine for that of plasmoquine-compound, and the results have been on the whole satisfactory, both clinically and parasitologically. The cases here described were treated in hospital where prolonged and accurate observations could be made.

Of 18 benign tertian cases 12 were in men and 6 in women; the youngest was a boy of 8 years of age. The average length of stay in hospital was 11 days and the parasites disappeared from the blood stream after an average amount of 13½ tablets of plasmoquine-compound (i.e., 0·135 g. plasmoquine + 1·687 g. quinine). As a rule the patient received a total amount of 25 tablets (i.e., 0·25 g. plasmoquine, 3·125 g. quinine) while in hospital.

In one case only was a slight cyanosis observed after the sixth day of administration of the drug. The only other untoward symptoms noted were dyspepsia, occasionally abdominal pains, and, in one case only, dizziness. Subsequent experience has shown that these could be removed by glucose ʒi., given daily, either in powder or liquid form. As with pure plasmoquine, a rapid contraction in the size of the spleen took place and a corresponding clinical improvement in the condition of the patient was noticed. In three cases, in which considerable blood destruction had taken place, there was an increase of red blood corpuscles of 1,000,000 within a week. In only one case did a rigor or secondary rise of temperature take place. Two of the best clinical cases of the series had previously exhibited intolerance to quinine, both by immediate dyspepsia and vomiting and later by tinnitus and cerebral irritability. In both the subsequent course of plasmoquine-compound was well tolerated.

Relapses.—No doubt relapses do occur, just as they do after prolonged quinine therapy. I have records of two clinical relapses within six months of the cessation of treatment in the above series of 18. Probably further experiences of plasmoquine-compound will indicate that a still more prolonged constant therapy is necessary to stamp out the infection from the body.

The 11 cases of *subtertian malaria* were all in males. Amongst them were five cases which, from the severity of the symptoms, could be legitimately regarded as of the pernicious form. One, from the acuteness of onset and the persistence of diarrhœa and vomiting, could be classified as a genuine case of abdominal malaria, and it was interesting to note that he showed a persistent leucocytosis of 20,000. One had recovered from a recent attack of blackwater fever, a third showed an intolerance to massive quinine therapy and had suffered from relapses in spite of it, while a fourt had been previously diagnosed on clinical grounds as tuberculosis. Very large numbers of crescents were found in the peripheral blood (132 to every 200 leucocytes). Crescents were present in three cases and ring-forms were found in eight. In one instance the appearance of scanty crescents in the peripheral blood was noted during the course of treatment with plasmoquine-compound (i.e., after 0·29 g. plasmoquine and 3·6 g. quinine). The length of treatment in hospital was 14 days and the average amount of plasmoquine-compound required to banish the infection was 13½ tablets (0·135 g. plasmoquine and 1·68 g. quinine). The average amount of the drug taken was 27½ tablets (or 0·27 g. plasmoquine and 3·37 g. quinine).



Temperature chart of a case of benign tertian malaria in a patient aged 10. Massive quinine therapy had been tried but had not prevented numerous relapses on alternate days. On treatment with plasmoquine-compound, as shown on the chart, the malaria was apparently cured, no relapses having been recorded since cessation of treatment six months ago. (The dosage is that of the smaller size tablet as describ above.)

On the whole the results were not so satisfactory as in benign tertian malaria. In two cases, owing to the severity of the symptoms—vomiting and pyrexia—the action of plasmoquine-compound had to be reinforced by two intramuscular injections of quinine, grs. 5 each. Nevertheless, in three very severe cases the clinical improvement was striking and quite as satisfactory as after intensive quinine treatment.

intestinal obstruction is becoming obvious. Earlier investigation with opaque enemata should help to separate this class of "dyspepsia" from other less serious conditions. It is largely delay which makes the mortality of colostomy so high.

A certain number of cases are beyond radical operation, from secondary spread, before any symptoms are noted by the patient. A preliminary colostomy (cæcostomy) is a wise precaution even where there is no obvious obstruction.

There is no need for great haste after the colostomy is established; weeks or even months may be needed before the patient is fit to undergo the more radical operation of resection of the cancerous growth.

THE THERAPEUTIC ACTION OF PLASMOQUINE AND PLASMOQUINE-COMPOUND* IN MALARIA.

BY PHILIP MANSON-BAHR, D.S.O., M.D. CAMB., F.R.C.P. LOND.,

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ONE of the first specifics in medicine to be discovered, quinine has held the premier place in the treatment of malaria for nearly 300 years, and, in spite of a vast amount of research upon the action of the alkaloids of cinchona during the last 14 years, no striking improvement has been made in its therapeutic qualities. No one can doubt the instantaneous and selective effect of quinine upon the malaria parasite, but the drug does not entirely extirpate the infection from the body; there usually remain trophozoites which migrate to some secure spot and there multiply and produce a relapse whenever conditions become favourable. Effective quinine therapy is based upon the belief that it is necessary to continue its administration in gradually decreasing dosage until two months from the time of the last appearance of the malaria parasites in the circulation; in other words, it is believed that only by constantly assailing the parasite with repeated doses of quinine is it possible to prevent it from multiplying and producing further relapses. This is especially true of the benign tertian parasite, *Plasmodium vivax*, which may produce an infection that it is almost impossible to eradicate with quinine until the natural life-span of the parasite has been run and it dies out from inanition. This may take from one to three years.

We have no really conclusive evidence that quinine —for instance the bihydrochloride salt—when injected intramuscularly or intravenously, is able to extirpate an infection more effectively or speedily than when it is absorbed by the alimentary tract. The drug is excreted equally rapidly from the body, and, although injection has its legitimate uses when quinine by the mouth cannot be tolerated, yet it is cumbrous, painful, and sometimes even dangerous. Some people, especially women, have an insufferable intolerance to the drug. In different subjects it may provoke intractable dyspepsia, vomiting, and diarrhœa, the most irritating tinnitus, or a toxic urticaria, while in some it is a powerful cerebral depressant. Research upon the various salts of quinine has not demonstrated that any particular combination has special curative or preventive virtue. The other alkaloids of cinchona bark—cinchonine, cinchonidine, and quinidine—possess no greater parasiticidal action than quinine itself. Obviously some alternative specific drug for malaria is eminently desirable.

Plasmoquine.

The chemical formula of quinine is complicated, but it is known to be a combination of a quinoline ring with piperidine. The former appears to be a protoplasmic poison. Many unsuccessful attempts have been made to synthesise quinine in the laboratory and other compounds have been elaborated in the process. Schulemann, Schönhöfer, and Wingler have synthesised a derivative of quinoline (ethylamino-quinoline-hydrochloride) which is now known as plasmoquine and which was found to exert a toxotropic effect upon the plasmodium of birds (*Plasmodium præcox*). According to Hörlein, its exact constitution is the salt of alkylamino-methoxyquinoline. Kopanaris, the brothers Sergent in Algiers, and Giemsa in Hamburg had already shown that quinine exerts an effect upon the plasmodium of canaries which is comparable to its effect upon the malaria parasites of man.

Estimation of Therapeutic Action.

The treatment of bird malaria with the various derivatives of the quinoline ring afforded a means of comparison of these compounds with the salts of quinine. Further extensive experiments upon canaries artificially infected with *P. præcox* were carried out by Roehl in the Chemotherapeutic Laboratories at Elberfeld. Difficulty was at first experienced in assessing the correct therapeutic action, as plasmoquine caused too violent a local reaction when injected into the breast muscles of these delicate creatures, and the exact amount ingested could not be estimated when it was mixed with their food. Finally Roehl devised a pipette about the size of a ureteric catheter, through which an exact amount of plasmoquine could be injected directly into the stomach of the canary and its effect upon the parasite accurately estimated. By calculating the amount of quinine necessary to cause a permanent disappearance of *P. præcox* from the blood of infected canaries, it was found that plasmoquine exerted a parasitotropic action 60 times greater than that of quinine. Another remarkable observation resulting from these experiments was that plasmoquine exercises an especially destructive action upon the sexual stages, or gametocytes, upon which quinine is almost inert. The next step was to test the effect of plasmoquine upon human malaria. A dose of 0·25 g. daily was found to exert toxic effects; the patient developed a blue lividity of the skin and nails, the blood became a peculiar chocolate-brown colour, due to the conversion of hæmoglobin into methæmoglobin, while partial collapse and sometimes vomiting was produced. This cyanosis, which, when intensive, is extremely alarming both to patient and physician, is now generally recognised as indicating that the dosage of plasmoquine is too large and that it is exerting a toxic effect. At first Mühlens and Sioli advocated a dose of 0·1 g. plasmoquine daily for three days after the disappearance of the malaria parasites from the circulation. Later it was found that even this dose was too large for general use and that 0·06 g. daily was sufficient to extirpate the infection without producing cyanosis. Plasmoquine is practically tasteless, but when chewed produces a curious anæsthetic effect on the tongue and pharynx. When tested by Sioli in therapeutic malaria for general paralysis and by Mühlens in a series of 134 naturally acquired infections, it was found that plasmoquine exerted the same lethal action upon the gametocytes of benign and subtertian malaria as it had already been shown to exert upon the *P. præcox* of birds. The gametocytes, or crescents, of the subtertian parasite disappeared after four days. The action of the drug upon trophozoites of the subtertian was much less satisfactory than upon similar stages of the benign tertian parasite. These observations I was able to confirm in a series of 28 cases of malaria treated in London in 1926. In addition I noted the rapid reduction in the size of the spleen; in some instances the shrinkage was so rapid as to cause very considerable pain over the splenic area, and in others the administration of the drug had to be discontinued on account of the acute abdominal pain it produced. It was found necessary to interrupt the course of plasmoquine to allow of the total excretion of the drug from the body. The drug could be given in full therapeutic doses (0·06–0·08 g.) daily for seven consecutive days for six separate weeks if a break of five days were allowed between each course.

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* Identical with plasmochin and plasmochin-compound.

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During the year 1927 and the early portion of 1928 I have discontinued the use of plasmoquine for that of plasmoquine-compound, and the results have been on the whole satisfactory, both clinically and parasitologically. The cases here described were treated in hospital where prolonged and accurate observations could be made.

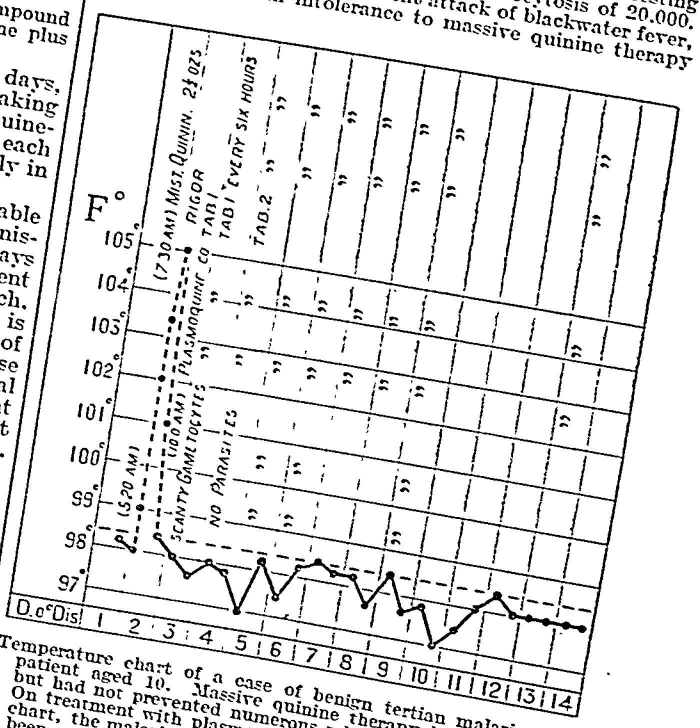
Of 18 benign tertian cases 12 were in men and 6 in women: the youngest was a boy of 8 years of age. The average length of stay in hospital was 11 days and the parasites disappeared from the blood stream after an average amount of 13½ tablets of plasmoquine-compound (i.e., 0·135 g. plasmoquine + 1·687 g. quinine). As a rule the patient received a total amount of 25 tablets (i.e., 0·25 g. plasmoquine, 3·125 g. quinine) while in hospital.

In one case only was a slight cyanosis observed after the sixth day of administration of the drug. The only other untoward symptoms noted were dyspepsia, occasionally abdominal pains, and, in one case only, dizziness. Subsequent experience has shown that these could be removed by glucose ʒi., given daily, either in powder or liquid form. As with pure plasmoquine, a rapid contraction in the size of the spleen took place and a corresponding clinical improvement in the condition of the patient was noticed. In three cases, in which considerable blood destruction had taken place, there was an increase of red blood corpuscles of 1,000,000 within a week. In only one case did a rigor or secondary rise of temperature take place. Two of the best clinical cases of the series had previously exhibited intolerance to quinine, both by immediate dyspepsia and vomiting and later by tinnitus and cerebral irritability. In both the subsequent course of plasmoquine-compound was well tolerated.

Relapses.—No doubt relapses do occur, just as they do after prolonged quinine therapy. I have records of two clinical relapses within six months of the cessation of treatment in the above series of 18. Probably further experiences of plasmoquine-compound will indicate that a still more prolonged constant therapy is necessary to stamp out the infection from the body.

The 11 cases of *subtertian malaria* were all in males. Amongst them were five cases which, from the severity of the symptoms, could be legitimately regarded as of the pernicious form. One, from the acuteness of onset and the persistence of diarrhœa and vomiting, could be classified as a genuine case of abdominal malaria, and it was interesting to note that he showed a persistent leucocytosis of 20,000. One had recovered from a recent attack of blackwater fever, a third showed an intolerance to massive quinine therapy and had suffered from relapses in spite of it, while a fourth had been previously diagnosed on clinical grounds as tuberculosis. Very large numbers of crescents were found in the peripheral blood (132 to every 200 leucocytes). Crescents were present in three cases and ring-forms were found in eight. In one instance the appearance of scanty crescents in the peripheral blood was noted during the course of treatment with plasmoquine-compound (i.e., after 0·29 g. plasmoquine and 3·6 g. quinine). The length of treatment in hospital was 14 days and the average amount of plasmoquine-compound required to banish the infection was 13½ tablets (0·135 g. plasmoquine and 1·68 g. quinine). The average amount of the drug taken was 27½ tablets (or 0·27 g. plasmoquine and 3·37 g. quinine).

On the whole the results were not so satisfactory as in benign tertian malaria. In two cases, owing to the severity of the symptoms—vomiting and pyrexia—the action of plasmoquine-compound had to be reinforced by two intramuscular injections of quinine, grs. 5 each. Nevertheless, in three very severe cases the clinical improvement was striking and quite as satisfactory as after intensive quinine treatment.



Temperature chart of a case of benign tertian malaria in a patient aged 10. Massive quinine therapy had been tried but had not prevented numerous relapses on alternate days. On treatment with plasmoquine-compound, as shown on the chart, the malaria was apparently cured, no relapses having been recorded since cessation of treatment six months ago. (The dosage is that of the smaller size tablet as described above.)

intestinal obstruction is becoming obvious. Earlier investigation with opaque enemata should help to separate this class of "dyspepsia" from other less serious conditions. It is largely delay which makes the mortality of colostomy so high.

A certain number of cases are beyond radical operation, from secondary spread, before any symptoms are noted by the patient. A preliminary colostomy (cæcostomy) is a wise precaution even where there is no obvious obstruction.

There is no need for great haste after the colostomy is established; weeks or even months may be needed before the patient is fit to undergo the more radical operation of resection of the cancerous growth.

THE THERAPEUTIC ACTION OF PLASMOQUINE AND PLASMOQUINE-COMPOUND* IN MALARIA.

BY PHILIP MANSON-BAHR, D.S.O., M.D. CAMB., F.R.C.P. LOND.,
PHYSICIAN TO THE HOSPITAL FOR TROPICAL DISEASES, LONDON.

ONE of the first specifics in medicine to be discovered, quinine has held the premier place in the treatment of malaria for nearly 300 years, and, in spite of a vast amount of research upon the action of the alkaloids of cinchona during the last 14 years, no striking improvement has been made in its therapeutic qualities. No one can doubt the instantaneous and selective effect of quinine upon the malaria parasite, but the drug does not entirely extirpate the infection from the body; there usually remain trophozoites which migrate to some secure spot and there multiply and produce a relapse whenever conditions become favourable. Effective quinine therapy is based upon the belief that it is necessary to continue its administration in gradually decreasing dosage until two months from the time of the last appearance of the malaria parasites in the circulation; in other words, it is believed that only by constantly assailing the parasite with repeated doses of quinine is it possible to prevent it from multiplying and producing further relapses. This is especially true of the benign tertian parasite, *Plasmodium vivax*, which may produce an infection that it is almost impossible to eradicate with quinine until the natural life-span of the parasite has been run and it dies out from inanition. This may take from one to three years.

We have no really conclusive evidence that quinine—for instance the bihydrochloride salt—when injected intramuscularly or intravenously, is able to extirpate an infection more effectively or speedily than when it is absorbed by the alimentary tract. The drug is excreted equally rapidly from the body, and, although injection has its legitimate uses when quinine by the mouth cannot be tolerated, yet it is cumbrous, painful, and sometimes even dangerous. Some people, especially women, have an insufferable intolerance to the drug. In different subjects it may provoke intractable dyspepsia, vomiting, and diarrhœa, the most irritating tinnitus, or a toxic urticaria, while in some it is a powerful cerebral depressant. Research upon the various salts of quinine has not demonstrated that any particular combination has special curative or preventive virtue. The other alkaloids of cinchona bark—cinchonine, cinchonidine, and quinidine—possess no greater parasiticidal action than quinine itself. Obviously some alternative specific drug for malaria is eminently desirable.

Plasmoquine.

The chemical formula of quinine is complicated, but it is known to be a combination of a quinoline ring with piperidine. The former appears to be a protoplasmic poison. Many unsuccessful attempts have been made to synthesise quinine in the laboratory and other compounds have been elaborated in the process. Schulemann, Schönhöfer, and Wingler have synthesised a derivative of quinoline (ethylamino-quinoline-hydrochloride) which is now known as plasmoquine and which was found to exert a toxotropic effect upon the plasmodium of birds (*Plasmodium præcox*). According to Hörlein, its exact constitution is the salt of alkylamino-methoxyquinoline. Kopanaris, the brothers Sergent in Algiers, and Giemsa in Hamburg had already shown that quinine exerts an effect upon the plasmodium of canaries which is comparable to its effect upon the malaria parasites of man.

Estimation of Therapeutic Action.

The treatment of bird malaria with the various derivatives of the quinoline ring afforded a means of comparison of these compounds with the salts of quinine. Further extensive experiments upon canaries artificially infected with *P. præcox* were carried out by Roehl in the Chemotherapeutic Laboratories at Elberfeld. Difficulty was at first experienced in assessing the correct therapeutic action, as plasmoquine caused too violent a local reaction when injected into the breast muscles of these delicate creatures, and the exact amount ingested could not be estimated when it was mixed with their food. Finally Roehl devised a pipette about the size of a ureteric catheter, through which an exact amount of plasmoquine could be injected directly into the stomach of the canary and its effect upon the parasite accurately estimated. By calculating the amount of quinine necessary to cause a permanent disappearance of *P. præcox* from the blood of infected canaries, it was found that plasmoquine exerted a parasitotropic action 60 times greater than that of quinine. Another remarkable observation resulting from these experiments was that plasmoquine exercises an especially destructive action upon the sexual stages, or gametocytes, upon which quinine is almost inert. The next step was to test the effect of plasmoquine upon human malaria. A dose of 0·25 g. daily was found to exert toxic effects; the patient developed a blue lividity of the skin and nails, the blood became a peculiar chocolate-brown colour, due to the conversion of hæmoglobin into methæmoglobin, while partial collapse and sometimes vomiting was produced. This cyanosis, which, when intensive, is extremely alarming both to patient and physician, is now generally recognised as indicating that the dosage of plasmoquine is too large and that it is exerting a toxic effect. At first Mühlens and Sioli advocated a dose of 0·1 g. plasmoquine daily for three days after the disappearance of the malaria parasites from the circulation. Later it was found that even this dose was too large for general use and that 0·06 g. daily was sufficient to extirpate the infection without producing cyanosis. Plasmoquine is practically tasteless, but when chewed produces a curious anæsthetic effect on the tongue and pharynx. When tested by Sioli in therapeutic malaria for general paralysis and by Mühlens in a series of 134 naturally acquired infections, it was found that plasmoquine exerted the same lethal action upon the gametocytes of benign and subtertian malaria as it had already been shown to exert upon the *P. præcox* of birds. The gametocytes, or crescents, of the subtertian parasite disappeared after four days. The action of the drug upon trophozoites of the subtertian was much less satisfactory than upon similar stages of the benign tertian parasite. These observations I was able to confirm in a series of 28 cases of malaria treated in London in 1926. In addition I noted the rapid reduction in the size of the spleen; in some instances the shrinkage was so rapid as to cause very considerable pain over the splenic area, and in others the administration of the drug had to be discontinued on account of the acute abdominal pain it produced. It was found necessary to interrupt the course of plasmoquine to allow of the total excretion of the drug from the body. The drug could be given in full therapeutic doses (0·06–0·08 g.) daily for seven consecutive days for six separate weeks if a break of five days were allowed between each course.

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* Identical with plasmochin and plasmochin-compound.

Culture showed a coliform bacillus, probably a contamination. The liver gave evidence of early nutmeg changes, but no evidence of cirrhosis was noted. Adherent ante-mortem clot was present in the splenic, portal, and mesenteric veins. The post-mortem note stated: "The phlebitis and thrombosis have presumably spread from the splenic pedicle along the splenic vein, but no proof of bacterial infection was obtained." No explicit note was made either at operation or at the post-mortem examination on the size of the splenic vein or the condition of its wall. The spleen was unfortunately not examined microscopically.

CASE 2. *Recovery.*—A man, aged 23, was admitted to hospital complaining of black stools. Four months previously he had had hæmatemesis, for which he had been treated at another hospital with Lenhartz diet and ultra-violet rays. On examination the spleen was palpable; jaundice and ascites were absent and there were no palpable lymph nodes. A blood count showed: Hæmoglobin, 48 per cent.; red cells, 3,200,000; white cells, 5600; colour-index, 0·75. The Wassermann and sigma reactions were negative, and so was van den Bergh's test. There was no history of malaria. A diagnosis of splenic anæmia was made and splenectomy performed.

Morbid Anatomy.—The spleen weighed 25 oz., and was firm and fibrous. Perisplenitis was absent, and there were no infarcts. Microscopically, it showed a rather a-cellular generalised fibrosis. There was no uniform congestion, but a few small scattered hæmorrhages were present, due possibly to operative trauma. The sinuses were not dilated and contained very few cells. There was no evidence of endothelial proliferation or the deposition of pigment. The picture was quite unlike that described by Tansini and Morone in splenomegaly due to portal thrombosis,[6] where the splenic sinuses were transformed into "large lakes of blood," and the pulp infiltrated with macrophages and pigment.

The patient recovered from the immediate effects of the operation, and eight days later a blood count showed: Red cells, 2,800,000; white cells, 8600; polymorphs, 6620; lymphocytes, 1030. An estimation of the hæmoglobin was not done. Thirteen days later the figures were: Hæmoglobin, 44 per cent; red cells, 3,400,000; white cells, 14,000; colour-index, 0·7.

On the fourteenth day after splenectomy the patient had a sudden attack of severe abdominal pain and vomited. His temperature dropped to 96°; the pulse-rate rising to 135. The abdomen become distended and free fluid was noted. No leucocyte count was done at this time. Intraperitoneal hæmorrhage was suspected, and it was decided to perform a suprapubic exploratory puncture. This was done, and two pints, not of blood but of clear yellow fluid, were withdrawn. A drainage-tube was left in, and the patient transfused with 400 c.cm. of blood. He vomited afterwards, and was rather restless. However, his temperature gradually improved, reaching normal on the third day, and he made a good recovery. Six months later a blood count showed: Red cells, 4,090,000; hæmoglobin, 50 per cent.; white cells, 9000. In spite of this, there can be little doubt that acute portal thrombosis supervened on the fourteenth day after splenectomy. The exact site must remain uncertain, but two facts—the ascites and the sudden severe pain—make it probable, as will appear later, that both portal and mesenteric veins were involved.

Signs and Symptoms of Portal Thrombosis.

The signs and symptoms of portal thrombosis are fairly well known and have been described exhaustively by Langdon-Brown.[7] They are more or less invariable, and include abdominal pain, ascites, diarrhœa with or without blood, vomiting with or without hæmatemesis, enlargement of the spleen and, if of acute onset, general shock. All these were present in the two cases described in this paper. Langdon-Brown suggests that the signs and symptoms may bear some relation to the site of thrombosis. "Broadly speaking, in any case of pylethrombosis, if ascites is present, the trunk of the vein is probably occluded; if hæmatemesis occurs, the splenic vein is probably involved; and if pain, vomiting, diarrhœa, and collapse are the leading symptoms, there is probably obstruction of the superior mesenteric vein." The onset is not always acute; it may be slow and progressive, though interrupted by critical episodes corresponding to fresh attacks of thrombosis. Frick [8] and Frugoni [9] emphasise this irregularity in progress as an important point of distinction between primary splenomegaly and that due to portal thrombosis. This point will be referred to later.

Acute thrombosis of the coronary vessels is well known to give rise to an emphatic leucocytosis. A leucocyte count in direct response to the acute abdominal condition was done in only two cases, in Case 1 of this paper, and in another case of acute portal thrombosis not described here. In the latter the count rose from 18,000 to 34,000 with the onset of symptoms. In Case 1 splenectomy had been performed 13 days previously, and splenectomy per se causes a leucocytosis. In fact, however, the appearance of acute symptoms introduces a figure of a different order from that anticipated on physiological grounds, so that this may be taken to represent leucocytosis of thrombogenic origin. Before splenectomy the leucocyte count was 1200; seven days afterwards it was 9500. With the onset of acute symptoms on the thirteenth day after operation it rose to the quite unexpected figure of 63,400. Further leucocyte counts in patients with portal thrombosis are to be desired, but the evidence of these two cases suggests that leucocytosis may occur.

Classification of the Two Cases.

It is clear that all these signs and symptoms, with the exception of a possible leucocytosis, are common both to portal thrombosis and (if they have any separate existence) to splenic anæmia and Banti's disease. The two cases under discussion are presented as examples of primary splenomegalic anæmia rather than of thrombosis, on the following grounds:—

1. That thrombosis was here the initial cause is improbable, as acute signs and symptoms attributable to thrombosis only occurred well within the course of an already established "splenomegalic anæmia."

2. The contention that this pre-established splenomegaly was itself the result of a slowly progressive thrombosis is difficult to maintain in view of three facts: (*a*) The absence in the past history of exacerbations similar to the one observed. Reference has already been made to the importance of this point, emphasised by Frick. (*b*) The absence in the records of the surgical procedure of any mention of such thrombosis or thrombophlebitis in situ. (*c*) The fact that Case 2 made such a complete and rapid recovery from his post-operative attack. If this had been merely the culmination of a slowly progressive thrombotic process extending over one year, such a rapid remission would seem most improbable, with or without splenectomy.

If these points be admitted, then Warthin's theory of an initial and invariable portal thrombosis as the underlying condition in both splenic anæmia and Banti's disease seems clearly inapplicable to these two cases. It is not maintained that portal thrombosis never gives rise to a picture indistinguishable from Banti's syndrome; it seems certain that it can, and does. But it is maintained that thrombosis seems peculiarly liable to develop during the course of a primary splenomegalic anæmia without lymphatic enlargements and with or without ascites. To argue in the reverse way would be on all fours with the attempt to show that portal thrombosis is the cause of hepatic cirrhosis, since Langdon-Brown [7] has shown that this is the commonest condition associated with portal thrombosis in general.

Rosenthal,[10] in a recent study of the platelets in Banti's disease, has shown that cases can be divided into two groups, thrombocytic and thrombopenic. The former he considers particularly liable to severe hæmorrhages; the latter to thromboses, especially post-operative. Unfortunately, platelet counts were not done on either of the cases considered here, but it is clear that the idea opens up a fresh field for investigation and offers a possible explanation of the frequency with which thrombosis occurs. The post-operative tendency to it may further be related to the fact that the red cells are apt to rise very rapidly after splenectomy, and Leon-Kindberg [11] reports transient polycythæmia on several occasions. This was present in Case 1 (red cells 6,890,000), although

Quartan Malaria.—I have had only one opportunity of observing the effects of plasmoquine-compound in quartan malaria.

The patient had suffered almost continuously for four years from persistent relapses of a peculiarly intractable form of fever which did not yield to quinine. She had a large and painful spleen and a scanty infection of quartan parasites in the peripheral blood. A full course of plasmoquine-compound was followed by a slight cyanosis, which was transitory and unaccompanied by any other alarming symptoms. The clinical results, as far as could be ascertained, were satisfactory and no more relapses have occurred. The physical condition is satisfactory.

Conclusions.

The time is not yet ripe to draw a final conclusion upon the rôle which plasmoquine is destined to play in the therapeutics of malaria. I am not suggesting that it is going to replace quinine in the treatment of every case, but I submit that sufficient evidence has now been accumulated to show that, under certain circumstances, it can act as an efficient substitute in patients who have been susceptible to, or intolerant of, large doses of quinine. Its most important property is that it affords an alternative treatment and is undoubtedly tolerated in severe cases with persistent vomiting when pure quinine is not. The amount of the drug necessary to banish the parasites from the blood is much smaller—a very important point—the taste is not disagreeable, the effects upon digestion are negligible, and it is well tolerated by children.

Occasional signs of relative intolerance to plasmoquine and plasmoquine-compound are slight cyanosis, dyspepsia, colic, and splenic pain.

SPLENIC ANÆMIA AND PORTAL THROMBOSIS.

BY J. CONWAY DAVIES, M.B. CAMB.,
M.R.C.P. LOND.,
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THE relation between splenic anæmia, Banti's disease, and portal thrombosis has been the subject of much controversy in medical literature. The current orthodox view applies the term "splenic anæmia" to a condition of primary splenomegalic anæmia of unknown origin, without enlargement of lymph nodes or cirrhosis of the liver and having a striking tendency to gastro-intestinal hæmorrhage; the expression "Banti's disease" is confined to cases in the above group which terminate in atrophic hepatic cirrhosis with ascites. Therefore cases of splenic anæmia which progress without showing any tendency to cirrhosis, or which develop a late hæmolytic jaundice—again without cirrhosis—as described by Banti himself,[1] would be excluded from this group. On the other hand, cases of splenic anæmia exhibiting later the signs of Banti's syndrome would be regarded after the event as early cases of Banti's disease. The latter, it is held, is a terminus towards which certain cases of splenic anæmia progress. They do not all do so, and therefore the terms can only be synonymous in certain cases, and then only retrospectively. Splenomegalic anæmia associated with syphilis, malaria, tuberculosis, or kala-azar should also, on this view, be grouped separately. According to this classification it will be seen that any case exhibiting Banti's *syndrome*, attributable to a hitherto recognised cause, ceases to be one of Banti's *disease*; this applies also to splenic anæmia. Both are essentially expectant groups awaiting nomination. This is the view taken by Leon-Kindberg, amongst others, in his admirably clear and discriminating article on the sclerotic splenomegalies.[2]

Differing Interpretations.

Many writers, however, chiefly French and American, disagree with this conception, and wish to classify the conditions under the general headings of (1) hepatic congestion or cirrhosis, (2) syphilis, and (3) malaria. Gilbert and Lereboullet,[3] in 1904, pointed out that a condition indistinguishable from Banti's disease can be produced by portal congestion of hepatic origin. The spleen, in their view, is the satellite of the liver, and splenomegaly of this type is merely an episode of portal hypertension. Persistence of the umbilical vein, so that excessive amounts of blood are carried to the portal sinus, has also been described as a cause. Oettinger and Fiessinger,[4] and Warthin,[5] consider that Banti's disease as such is an illusion, and describe a group of splenomegalic anæmias associated with portal thrombosis. Warthin is particularly out-spoken, and says: "Until it has been shown that the splenic anæmia of Banti's complex can exist without any evidence of obstruction in the portal or splenic veins, then my contention must hold that the complex is no disease-entity. Until this is done, splenic anæmia and Banti's disease must be regarded as coördinated symptom-complexes and not individual disease-entities." Elsewhere he says that an infective thrombophlebitis of the portal or splenic veins is the essential feature of all these cases, no matter under what head reported—splenic or portal thrombosis, splenic anæmia or Banti's disease. The importance of this view is further emphasised by the fact that of the six cases diagnosed clinically as either splenic anæmia or Banti's disease in the post-mortem register at St. Bartholomew's Hospital since 1920, portal thrombosis was present in every one. The facts, then, are not in question. What seems doubtful is the interpretation to be placed upon them, whether such thrombosis is primary or secondary, and the exact discrimination of the causal sequences at work. Relation in point of time is notoriously difficult to establish by post-mortem methods, and it is difficult to see how this question can be settled other than by an analysis of events occurring within the course of the disease itself. Two cases, occurring recently at St. Bartholomew's Hospital, seem to go some way towards meeting Warthin's challenge and supplying a solution to this problem.

Two Cases Related.

CASE 1. *Fatal Termination.*—A woman of 50 was admitted to hospital complaining of breathlessness, palpitation, epigastric pain after food, and pain in the left side of the chest, all of one year's duration. She was pale and sallow. The spleen was palpable, and both it and the liver were described as being "three fingers-breadth below the costal margin." Ascites was absent. There had been no hæmatemesis. The Wassermann and sigma reactions were negative, and the fragility of the red cells was within normal limits. Van den Bergh's test was not done, but there was no obvious jaundice. A blood count showed: Hæmoglobin, 35 per cent.; red cells, 2,540,000; white cells, 3800 (polymorphs, 2508; lymphocytes, 1216); colour-index, 0·7. No nucleated red cells or megaloblasts were seen.

The patient had never had malaria or jaundice, and there were no enlarged lymph nodes. A diagnosis of splenic anæmia was made, and three blood transfusions were given, which raised the hæmoglobin to 40 per cent. and the red blood cells to 4,900,000. Splenectomy was then performed. The patient progressed uneventfully until the fourteenth day after operation, when she suddenly felt faint and her temperature dropped from 99° to 95° F.; pulse-rate, 100; respirations, 20. The abdomen was distended, but no pain, tenderness, rigidity, or shifting dullness was noticed. The patient passed two stools containing bright-red blood. Early the next morning the pulse-rate suddenly rose to 150; temperature, 95°; respirations, 20. A blood count at this time showed: Red cells, 6,890,000; hæmoglobin, 85 per cent.; white cells, 63,400. (Six days after operation a leucocyte count showed only 6900.) The striking rise in the number of red cells and in the hæmoglobin content was evidently due to sudden concentration of the blood, associated with shock. The patient was considered too ill for operation, but a further transfusion was done, one hour after which the temperature rose to 102°. The patient died the following morning with a temperature of 107°.

Post-mortem Examination.—The peritoneal cavity contained much clear yellowish fluid. The lower three feet of the ileum were congested and œdematous. The ligatures on the splenic pedicle were intact and there was no evidence of suppuration. A film made from the tissues of the pedicle and stained by Gram's method showed no organisms

Culture showed a coliform bacillus, probably a contamination. The liver gave evidence of early nutmeg changes, but no evidence of cirrhosis was noted. Adherent ante-mortem clot was present in the splenic, portal, and mesenteric veins. The post-mortem note stated: "The phlebitis and thrombosis have presumably spread from the splenic pedicle along the splenic vein, but no proof of bacterial infection was obtained." No explicit note was made either at operation or at the post-mortem examination on the size of the splenic vein or the condition of its wall. The spleen was unfortunately not examined microscopically.

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1. That thrombosis was here the initial cause is improbable, as acute signs and symptoms attributable to thrombosis only occurred well within the course of an already established "splenomegalic anæmia."

2. The contention that this pre-established splenomegaly was itself the result of a slowly progressive thrombosis is difficult to maintain in view of three facts: (*a*) The absence in the past history of exacerbations similar to the one observed. Reference has already been made to the importance of this point, emphasised by Frick. (*b*) The absence in the records of the surgical procedure of any mention of such thrombosis or thrombophlebitis in situ. (*c*) The fact that Case 2 made such a complete and rapid recovery from his post-operative attack. If this had been merely the culmination of a slowly progressive thrombotic process extending over one year, such a rapid remission would seem most improbable, with or without splenectomy.

If these points be admitted, then Warthin's theory of an initial and invariable portal thrombosis as the underlying condition in both splenic anæmia and Banti's disease seems clearly inapplicable to these two cases. It is not maintained that portal thrombosis never gives rise to a picture indistinguishable from Banti's syndrome; it seems certain that it can, and does. But it is maintained that thrombosis seems peculiarly liable to develop during the course of a primary splenomegalic anæmia without lymphatic enlargements and with or without ascites. To argue in the reverse way would be on all fours with the attempt to show that portal thrombosis is the cause of hepatic cirrhosis, since Langdon-Brown[7] has shown that this is the commonest condition associated with portal thrombosis in general.

Rosenthal,[10] in a recent study of the platelets in Banti's disease, has shown that cases can be divided into two groups, thrombocytic and thrombopenic. The former he considers particularly liable to severe hæmorrhages; the latter to thromboses, especially post-operative. Unfortunately, platelet counts were not done on either of the cases considered here, but it is clear that the idea opens up a fresh field for investigation and offers a possible explanation of the frequency with which thrombosis occurs. The post-operative tendency to it may further be related to the fact that the red cells are apt to rise very rapidly after splenectomy, and Leon-Kindberg[11] reports transient polycythæmia on several occasions. This was present in Case 1 (red cells 6,890,000), although

Quartan Malaria.—I have had only one opportunity of observing the effects of plasmoquine-compound in quartan malaria.

The patient had suffered almost continuously for four years from persistent relapses of a peculiarly intractable form of fever which did not yield to quinine. She had a large and painful spleen and a scanty infection of quartan parasites in the peripheral blood. A full course of plasmoquine-compound was followed by a slight cyanosis, which was transitory and unaccompanied by any other alarming symptoms. The clinical results, as far as could be ascertained, were satisfactory and no more relapses have occurred. The physical condition is satisfactory.

Conclusions.

The time is not yet ripe to draw a final conclusion upon the rôle which plasmoquine is destined to play in the therapeutics of malaria. I am not suggesting that it is going to replace quinine in the treatment of every case, but I submit that sufficient evidence has now been accumulated to show that, under certain circumstances, it *can act as an efficient substitute* in patients who have been susceptible to, or intolerant of, large doses of quinine. Its most important property is that it affords an alternative treatment and is undoubtedly tolerated in severe cases with persistent vomiting when pure quinine is not. The amount of the drug necessary to banish the parasites from the blood is much smaller—a very important point—the taste is not disagreeable, the effects upon digestion are negligible, and it is well tolerated by children.

Occasional signs of relative intolerance to plasmoquine and plasmoquine-compound are slight cyanosis, dyspepsia, colic, and splenic pain.

SPLENIC ANÆMIA AND PORTAL THROMBOSIS.

By J. CONWAY DAVIES, M.B. Camb., M.R.C.P. Lond.,

PHYSICIAN TO THE SEAMEN'S HOSPITAL, GREENWICH; DEMONSTRATOR OF PATHOLOGY, ST. BARTHOLOMEW'S HOSPITAL.

The relation between splenic anæmia, Banti's disease, and portal thrombosis has been the subject of much controversy in medical literature. The current orthodox view applies the term "splenic anæmia" to a condition of primary splenomegalic anæmia of unknown origin, without enlargement of lymph nodes or cirrhosis of the liver and having a striking tendency to gastro-intestinal hæmorrhage; the expression "Banti's disease" is confined to cases in the above group which terminate in atrophic hepatic cirrhosis with ascites. Therefore cases of splenic anæmia which progress without showing any tendency to cirrhosis, or which develop a late hæmolytic jaundice—again without cirrhosis—as described by Banti himself,[1] would be excluded from this group. On the other hand, cases of splenic anæmia exhibiting later the signs of Banti's syndrome would be regarded after the event as early cases of Banti's disease. The latter, it is held, is a terminus towards which certain cases of splenic anæmia progress. They do not all do so, and therefore the terms can only be synonymous in certain cases, and then only retrospectively. Splenomegalic anæmia associated with syphilis, malaria, tuberculosis, or kala-azar should also, on this view, be grouped separately. According to this classification it will be seen that any case exhibiting Banti's *syndrome*, attributable to a hitherto recognised cause, ceases to be one of Banti's *disease;* this applies also to splenic *anæmia*. Both are essentially expectant groups awaiting nomination. This is the view taken by Leon-Kindberg, amongst others, in his admirably clear and discriminating article on the sclerotic splenomegalies.[2]

Differing Interpretations.

Many writers, however, chiefly French and American, disagree with this conception, and wish to classify the conditions under the general headings of (1) hepatic congestion or cirrhosis, (2) syphilis, and (3) malaria. Gilbert and Lereboullet,[3] in 1904, pointed out that a condition indistinguishable from Banti's disease can be produced by portal congestion of hepatic origin. The spleen, in their view, is the satellite of the liver, and splenomegaly of this type is merely an episode of portal hypertension. Persistence of the umbilical vein, so that excessive amounts of blood are carried to the portal sinus, has also been described as a cause. Oettinger and Fiessinger,[4] and Warthin,[5] consider that Banti's disease as such is an illusion, and describe a group of splenomegalic anæmias associated with portal thrombosis. Warthin is particularly out-spoken, and says: "Until it has been shown that the splenic anæmia of Banti's complex can exist without any evidence of obstruction in the portal or splenic veins, then my contention must hold that the complex is no disease-entity. Until this is done, splenic anæmia and Banti's disease must be regarded as coördinated symptom-complexes and not individual disease-entities." Elsewhere he says that an infective thrombophlebitis of the portal or splenic veins is the essential feature of all these cases, no matter under *what head reported—splenic or portal thrombosis*, splenic anæmia or Banti's disease. The importance of this view is further emphasised by the fact that of the six cases diagnosed clinically as either splenic anæmia or Banti's disease in the post-mortem register at St. Bartholomew's Hospital since 1920, portal thrombosis was present in every one. The facts, then, are not in question. What seems doubtful is the interpretation to be placed upon them, whether such thrombosis is primary or secondary, and the exact discrimination of the causal sequences at work. Relation in point of time is notoriously difficult to establish by post-mortem methods, and it is difficult to see how this question can be settled other than by an analysis of events occurring within the course of the disease itself. Two cases, occurring recently at St. Bartholomew's Hospital, seem to go some way towards meeting Warthin's challenge and supplying a solution to this problem.

Two Cases Related.

CASE 1. *Fatal Termination.*—A woman of 50 was admitted to hospital complaining of breathlessness, palpitation, epigastric pain after food, and pain in the left side of the chest, all of one year's duration. She was pale and sallow. The spleen was palpable, and both it and the liver were described as being "three fingers-breadth below the costal margin." Ascites was absent. There had been no hæmatemesis. The Wassermann and sigma reactions were negative, and the fragility of the red cells was within normal limits. Van den Bergh's test was not done, but there was no obvious jaundice. A blood count showed: Hæmoglobin, 35 per cent.; red cells, 2,540,000; white cells, 3800 (polymorphs, 2508; lymphocytes, 1216); colour-index, 0·7. No nucleated red cells or megaloblasts were seen.

The patient had never had malaria or jaundice, and there were no enlarged lymph nodes. A diagnosis of splenic anæmia was made, and three blood transfusions were given, which raised the hæmoglobin to 40 per cent. and the red blood cells to 4,900,000. Splenectomy was then performed. The patient progressed uneventfully until the fourteenth day after operation, when she suddenly felt faint and her temperature dropped from 99° to 95° F.; pulse-rate, 100; respirations, 20. The abdomen was distended, but no pain, tenderness, rigidity, or shifting dullness was noticed. The patient passed two stools containing bright-red blood. Early the next morning the pulse-rate suddenly rose to 150; temperature, 95°; respirations, 20. A blood count at this time showed: Red cells, 6,890,000; hæmoglobin, 85 per cent.; white cells, 63,400. (Six days after operation a leucocyte count showed only 6900.) The striking rise in the number of red cells and in the hæmoglobin content was evidently due to sudden concentration of the blood, associated with shock. The patient was considered too ill for operation, but a further transfusion was done, one hour after which the temperature rose to 102°. The patient died the following morning with a temperature of 107°.

Post-mortem Examination.—The peritoneal cavity contained much clear yellowish fluid. The lower three feet of the ileum were congested and œdematous. The ligatures on the splenic pedicle were intact and there was no evidence of suppuration. A film made from the tissues of the pedicle and stained by Gram's method showed no organisms.

capsule was thickened. There was no evidence naked-eye to suggest a chronic enlargement, the fibrous trabeculæ and vascular sheaths appearing normal. Nor was there any secondary condition such as an infarct which would have given rise to the rupture. Unfortunately no microscopical examination was made.

The interest of the case lies in its being opposed to the generally accepted opinion that great enlargement of the spleen does not usually occur in a primary attack of induced malaria. Dr. Philip Manson-Bahr informs me that in naturally acquired malaria the mortality from ruptured spleen is only about one in every hundred thousand infections, and I believe that there have only been four similar cases recorded after induction of malaria. The case would be more easily explicable had there been a history of previous malaria, pointing to chronic enlargement of the spleen. Personally, I feel that, when treating cases of general paralysis with malaria, a careful watch should be kept for undue enlargement of the spleen, especially if the patient has previously had malaria.

My thanks are due to Dr. Manson-Bahr and the Ministry of Pensions for their information; also to the medical superintendent of this hospital for allowing me to publish the case.

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Public Health Services.

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Dr. T. Chetwood's report is this year limited to a concise statement of the progress of medical inspection and treatment. Shortage of staff may account for the brevity of his survey, for he says that an additional school medical officer is urgently required, and it is also clear that additions to the school nursing service are desirable.

Sheffield differs from most other English towns in separating the offices of school medical officer and medical officer of health, but the two departments are in daily and friendly consultation. In the existing open-air school there is accommodation only for 290 day scholars, but plans have already been approved for the establishment of a new school at Bents Green, with room for 50 residential pupils and 100 day scholars. Since Sheffield contains nearly 2000 delicate children, this additional school is obviously required. Valuable work is being done for delicate and convalescent children at a home at Fairthorn Green, supported by the generosity of the Sheffield teachers. A new central clinic has been opened at Leopold-street, which is also the administrative centre of the school medical service. Increased clinic accommodation is needed. Dr. Chetwood offers his thanks to many practitioners for willing coöperation and help in the effort to secure for school-children prompt treatment of their ailments, and the implication is that Sheffield practitioners are not reluctant to take advantage of such facilities as X ray treatment for ringworm afforded by the clinics.

The clinics received for treatment only seven children from the welfare centre, and there is still no nursery school in the city, but it is hoped that one will be opened during the current year. Mr. G. Wilkinson, whose resignation from the post of aural surgeon is much regretted, evidently had the confidence of the parents, for out of 232 cases of tonsils and adenoids recommended for operation, there were only 18 whose parents refused treatment. The ophthalmic surgeons dealt with 1179 new cases during the year, and the dental clinic with 18,000. 128 extra evening clinics were held after school hours for children suffering from toothache. This service is much appreciated locally, but most local authorities throughout the country do not favour large number of casuals, and possibly, when extra dental surgeons are appointed in Sheffield, the routine work will be so extended that casual sufferers will be almost eliminated. Dr. E. F. Skinner, the dermatologist, reports that severe cases of ringworm seem to be getting fewer every year. Among those who are afflicted X ray treatment is less often required; very small patches are dealt with, cheaply and efficiently, by shaving and parasiticide ointment, while 27 selected cases have been treated by the thallium acetate method with good results. Orthopædic treatment is given at the Edgar Allen Institute, and there are three special schools for physical defectives, and a residential sanatorium school for surgical tuberculosis. The school arrangements will be much improved when the education authority has appointed the proposed special orthopædic surgeon. The report of the superintendent of physical training, Mr. H. Cole, forms an interesting appendix, and his observations on the importance of postural training to health and efficiency are convincing.

Wigan.

Wigan has not in the past been a very healthy place for children to live in, and school medicine and hygiene are therefore of particular importance. Unfortunately the county borough still lacks many of the valuable agencies to be found elsewhere. For example, no open-air school exists, though there are large numbers of delicate children in Wigan. The initial cost of a residential open-air school would be considerable; Dr. H. Whitehead asks at present only for an open-air day school, and this at least should be established forthwith. Fifteen per cent. of the children attending school in Wigan are verminous. This figure, which is much too high, is nevertheless an improvement on former records. There are no school baths and the accommodation at the Corporation baths is quite inadequate. The congestion may soon be somewhat relieved by the establishment of Corporation baths at Pemberton. Physical drill is taken by the teachers with the advice of the assistant school medical officer, in the absence of any organiser of physical training. A number of girls have spinal curvatures, for which special exercises are necessary. For children with severe deformities a P.D. school is urgently needed. Following operative treatment for tonsils and adenoids, the children are taken home by ambulance, accompanied by a school nurse. This arrangement is certainly preferable to a journey home by public conveyance, but not comparable to the organisation now established by more progressive authorities, whereby children are retained in hospital for at least one night following the operation. In two directions the county borough has made some advance: (1) a definite scheme has been put into operation which will eventually ensure proper care and attention for orthopædic cases—the central clinic is already in working order; (2) in July, artificial sunlight treatment began at the Infirmary, and the results up to date have been very good. It is hoped that a light centre will be provided at an early date by the local authority in order that more cases may be treated.

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it must be remembered that here shock was probably the predominant factor.

Summary.

The relationships between splenic anæmia, Banti's disease, and portal thrombosis are mentioned. The classical view of Banti, and later of Leon-Kindberg, is summarised, and contrasted with that of Warthin. Two cases of anæmia with splenomegaly associated with portal thrombosis are described in detail. Reasons are given for believing them to be examples of primary splenomegalic anæmia (which therefore exists) rather than of thrombotic splenomegaly. For this reason it is suggested that they may meet Warthin's challenge, quoted in the body of the paper. Rosenthal's work on the platelet content of the blood in Banti's disease is mentioned, and an attempt made to relate this with the tendency to thrombosis.

I have to thank Prof. G. E. Gask, Mr. R. M. Vick, and Dr. George Graham for their kindness in allowing me to refer to cases under their charge.

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Clinical and Laboratory Notes.

A CASE OF CERVICAL RIB.

By George A. Dunlop, M.B. St. And.,
D.T.M. & H. Liverp.,
MEDICAL OFFICER TO THE EUROPEAN HOSPITAL, KUALA LUMPUR, FEDERATED MALAY STATES.

The discovery of cervical rib by X rays is not uncommon, but the symptoms of this case were interesting.

The patient, an assistant school-master, is a healthy man of 24, who has twice fractured his left clavicle. I first saw him in his bungalow in October, 1927, when he looked rather pale and complained of a feeling of compression over the left side of the chest and of severe pain in the left supraclavicular region, radiating down the left arm. He felt "giddy" and "faint," and had "palpitation." The pulse-rate was 140 but regular, the apex-beat was visible in the fifth interspace just outside the nipple line. The heart sounds were well heard at all areas, regular and closed. There was no swelling or œdema of the arms or legs, and no bony deformity of the clavicle; nothing abnormal could be palpated at the root of the neck and there were no signs or symptoms of disease of the nervous system.

He stated that he had had a number of these attacks since August, 1926, the first attack occurring in a rickshaw, when he had "giddiness in the head, general numbness down the left arm and side, and pain in the chest." This was diagnosed as pseudo-angina. A second attack, in October, 1926, was similar, but he noticed "a feeling of tightness in the left arm and a swollen appearance of the veins." During a third attack, in November, 1926, while in a motor-car, there was "numbness" and a feeling of cold in both arms and extreme cardiac pain. In December, 1926, he had a fourth attack in Hong-Kong during a dance, when, after the first dance, he had a violent palpitation and similar sensations in the arm and chest on the left side only. During 1927 he had a series of similar attacks up to October, when I saw him. He also had attacks of palpitation in bed at night after he had been lying down for some time, and he recognised prodromal symptoms of sleepiness and general weariness before an attack.

About ten days after I first saw him, the head-master of his school telephoned me to come urgently as the patient had "fainted" while teaching and was unconscious. When I arrived he appeared to have just regained consciousness. His face was bluish, his respirations quick, and his pulse-rate 167. He was very confused mentally and was groaning. There was no swelling of either arm, and he said that the compression and pain in the chest was suffocating him. He was assisted to his feet but was too "giddy" to stand alone; he felt better after being made to walk about. He had developed a marked neurosis about his condition and was glad to come into hospital for investigation.

Physical examination did not reveal anything, but X ray examination of the upper thorax and cervical region showed bilateral cervical rib. The clavicles were normal in outline. He was shown the X ray films, the condition was explained to him, and he was discharged. During the next five months the neurotic symptoms cleared up, but he had occasional attacks of pain, palpitation, and a feeling of constriction of the chest. I advised him to walk about at the onset of an attack, and this relieves him. As he was proceeding to England on leave he was advised to seek surgical advice at home.

Dr. R. Dowden, principal medical officer, F.M.S., kindly gave me permission to communicate this case.

NORMAL BIRTH OF A CHILD WEIGHING SIXTEEN POUNDS.

By F. R. Parakh, M.D. Manch., M.R.C.S. Eng.,
CHIEF MEDICAL OFFICER, DR. PARAKH HOSPITAL, BOMBAY.

A Parsee woman was admitted to the Dr. Parakh Hospital on Jan. 13th, 1927, with strong pains and in full labour. The woman was well built, of average weight and height. She was 28 years old, and a primipara, with normal pelvic measurements. The abdomen was enormously enlarged, and twins, hydramnios or triplets were suspected, but after a careful examination these were eliminated and a monster or a giant was diagnosed. There were no fœtal heart sounds audible, and as the head was fairly low into the pelvic cavity, and the soft parts were dilating and bulging well, no interference was indicated. After a labour of 11 hours she was delivered of a well-formed healthy stillborn child weighing 16 pounds. The child showed no signs of any monstrosity or any other deformities, and looked a child of three months of age. The length of the fœtus was 59 cm., and the testicles very large. There was a plentiful growth of hair on the head, the bones of which were fairly hard. The father of the child is a small-made man of 30 years of age. Two children by his first wife weighed 9 and 10 pounds each. All the members of his family and his present wife's family are of ordinary size and weight.

The puerperium has been normal throughout, and the perineum, which was badly ruptured, has healed well and firmly.

A CASE OF
RUPTURE OF THE SPLEEN AFTER ARTIFICIAL INDUCTION OF MALARIA.

By Noel G. Harris, M.B. Lond.,
ASSISTANT MEDICAL OFFICER, SPRINGFIELD MENTAL HOSPITAL, TOOTING.

The following case is, I think, worth recording:—

A man, aged 30, was admitted to Springfield Mental Hospital suffering from general paralysis of the insane. The disease was in an early stage, the first symptoms having been noticed only three to four months before admission. Physically he was sound, except for the fact that he suffered from chronic dysentery, having contracted both the amœbic and bacillary forms during the late war. There was no history of any malarial infection.

On Dec. 6th he was inoculated with benign tertian malaria. He had ten good rises of temperature lasting over a period of 12 days. On the morning following the tenth rise he jumped out of bed suddenly. A few seconds after getting back he collapsed, and was dead in an hour. At autopsy the abdomen was found to be full of blood from a ruptured spleen. The spleen was only semi-solid, and the vessels appeared to have just torn away, no defined rent being visible. The capsule was thickened. There was no evidence naked-eye to suggest a chronic enlargement, the fibrous trabeculæ and vascular sheaths appearing normal. Nor was there any secondary condition such as an infarct which would have given rise to the rupture. Unfortunately no microscopical examination was made.

The interest of the case lies in its being opposed to the generally accepted opinion that great enlargement of the spleen does not usually occur in a primary attack of induced malaria. Dr. Philip Manson-Bahr informs me that in naturally acquired malaria the mortality from ruptured spleen is only about one in every hundred thousand infections, and I believe that there have only been four similar cases recorded after induction of malaria. The case would be more easily explicable had there been a history of previous malaria, pointing to chronic enlargement of the spleen. Personally, I feel that, when treating cases of general paralysis with malaria, a careful watch should be kept for undue enlargement of the spleen, especially if the patient has previously had malaria.

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Cambridge.

The percentage of children requiring treatment (7 per cent.) is remarkably low in Cambridge compared with the rest of the country, and the fact that it is higher in 1927 than in the previous seven years is probably due to more stringent marking. On the other hand, the tuberculosis figures for Cambridge are high—38 cases were notified for pulmonary tuberculosis—that is nearly 2 per cent. of those seen at routine inspection, the usual figure for England and Wales being about ½ per cent. The open-air school about to be opened may do much to combat this high incidence. The proposed school will not be quite of the usual type, since it is to accommodate 120 physically defective and also 30 mentally defective children. Previously there were no special schools, and the exact type of child taken into the class for backward children is not specified. Dr. A. J. Laird gives a table showing the steady decline of cases of ringworm in the borough over a period of 14 years.

Cambridge is well known for pioneer dental work, and Mr. W. Baird Grandison can use for comparison tables dating from 1908. Three sets of figures are given to show how much improvement has been effected during this period. The percentage of sound permanent teeth has risen from 12·5 per cent. in 1909 to 63 per cent. in 1927. The proportion of children with sound dentitions, temporary as well as permanent, is now 39·2 per cent. against 2·6 per cent. in 1909. The percentage of unsavable permanent teeth is said to have decreased from 30·6 per cent. in 1909 to 1 per cent. in 1927. These figures are set out to prove the value of a deliberate attempt to preserve the permanent dentition by sound preventive and constructive principles. Mr. Grandison acknowledges the coöperation of other workers, especially the teachers. A scheme of dental education was applied to 150 older girls; the course of lectures was followed by an examination, the results of which were so good that the lectures are to be repeated to double the number of children. Mr. Grandison makes a special plea that if an 11 o'clock meal is held to be desirable, the food consumed should be selected so as to eliminate injury to the teeth.

MENTAL HOSPITAL REPORTS.

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Institutions for Private Patients.

There were 173 patients at *James Murray's Royal Asylum, Perth,* on March 31st last. Forty-two of the 66 new patients admitted during the year came on a voluntary basis. The recovery-rate among voluntary boarders was 39 per cent.; among the certified 30 per cent. The medical superintendent ascribes the difference in the figures partly to the feeling of spontaneous coöperation and the absence of compulsion and restraint. He discusses the problem of the voluntary patient in an interesting essay. The bodily health on admission was seriously impaired in most cases. The death-rate was 8·6 per cent.; autopsy was performed after 5 of the 14 deaths. The general health was good and there were no epidemics. The chief structural improvement of the year was the installation of a new central heating plant in the autumn. In each hospital ward an airy annexe has been provided for elderly infirm patients. Half the attendants, but only 18 per cent. of the nurses are certificated. The seaside home at Elie provides for some convalescent women patients. A few patients work in the gardens.

The report of *The Retreat, York*, is, as usual, beautifully illustrated; one photograph shows a group of articles made by patients, and is a testimonial to the occupation centre, which is already demanding more room for expansion. There were 199 patients on the books at the end of the year; 66 out of the 104 patients admitted came voluntarily. The recovery-rate was 27 per cent. and the death-rate 5·8 per cent. There was no serious epidemic disease, although influenza raged in the neighbourhood. The prophylactic campaign against it forms the subject of an interesting special report; the principal measure was a daily throat spray and gargle for all. General paralysis is being treated by induced malaria and the medical superintendent feels that this therapeutic measure is undoubtedly efficacious in most cases. A house at Goathland was rented for the summer and new accommodation, including 13 acres of ground, has been secured at Garrow Hill. The out-patient clinic at York County Hospital is running well. Parole beyond the grounds is granted to 21 patients, and within the grounds to 53. Forty-four of the patients are usefully employed. Fifty nursing staff are certificated.

Barnwood House Hospital, near *Gloucester*, had an average of 142 patients in residence during 1927, and the number of certified patients admitted during the year was greater than the number of voluntary boarders—contrary to expectation. The recovery-rate was 36 per cent. and the death-rate 7 per cent. The general health was good. One case of general paralysis was treated by induced malaria but showed no improvement. Several patients were treated by protein shock, but the results were not encouraging. Visiting specialists have been appointed and a laryngologist is to be added to their number. The wireless installations are much appreciated by the patients, and classes in handicrafts are held during the winter months. Five new bedrooms have been added on the male side, three of them with verandahs. Negotiations are in progress for installing electric light, and a new solarium has been opened. Full parole is allowed to 17 patients and limited parole to another 20. About half the nurses are certificated. three more having obtained their M.P.A. certificate during the year, while three others passed the General Nursing Council's final examination.

The eighteenth report of the *Scottish Western Asylums Research Institute* is somewhat unhappy reading. for it is doubtful whether the work can be carried on unless further funds are obtainable. Of its value there is no doubt, and a special meeting of the committee declared that it would be nothing short of a disaster if the scheme were abandoned. There has never been enough money to provide for an adequate staff, and at least £2500 would be needed annually to run the institute as it ought to be run. We sincerely hope that some solution of the problem may be found. The routine work of the year has been on the usual lines, except that the number of investigations for typhoid diminished considerably. In all, 1256 specimens were examined, chiefly for blood tests. Research has been carried out into the treatment of general paralysis and the chemistry of the cerebro-spinal fluid. A brief summary is given of the comparative results of treating general paralysis by various methods. Classes for medical officers have been held from time to time.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 25TH, 1928.*

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 141 (last week 114); scarlet fever, 1419; diphtheria, 816; enteric fever, 153; pneumonia, 514; puerperal fever, 48; puerperal pyrexia, 88; cerebro-spinal fever, 6; acute poliomyelitis, 15; encephalitis lethargica, 22; continued fever, 1; dysentery, 5; ophthalmia neonatorum, 129. No case of cholera, plague, or typhus fever was notified during the week.

The following counties each notified three or more cases of enteric fever:—London, 30; Essex, 37 (of which Colchester 31); Kent, 4; Lancaster, 11; Middlesex, 5; Norfolk, 3; Northumberland, 3 (Newcastle-on-Tyne); Southampton, 4; Suffolk East, 3; Surrey, 14; Sussex East, 4; Yorks West Riding, 5; Monmouth, 3. The total of 153 includes 46 cases of paratyphoid fever, of which 16 were notified in London and 11 in Surrey.

The cases of small-pox were notified from the following 18 counties:—London, 1; Derby, 14; Durham, 24; Essex, 1 (East Ham); Gloucester, 2 (Bristol); Lancaster, 7; Northampton, 10 (Northampton); Northumberland, 4; Nottingham, 3; Soke of Peterborough, 1; Stafford, 10 (Walsall); Warwick, 6 (Coventry); Yorks, East Riding, 4 (Hull); North Riding, 1 (Middlesbrough); West Riding, 30 (Goole 8, Pontefract 9); City of York, 1; Glamorgan, 9; Monmouth, 13.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on August 28th–29th was as follows:—Small-pox under treatment, 12; scarlet fever, 1495; diphtheria, 1499; enteric fever, 122; measles, 137; whooping-cough, 255; puerperal fever, 13 (plus 6 babies); encephalitis lethargica, 71; polio-myelitis, 2; "other diseases," 18. At St. Margaret's Hospital there were 18 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 5 (0) from enteric fever, 10 (0) from measles, 1 (1) from scarlet fever, 30 (5) from whooping-cough, 20 (1) from diphtheria, 89 (28) from diarrhœa and enteritis under two years, and 18 (4) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London were reported from Southampton, Coventry, Tynemouth, Newport, and Cardiff. Of the 10 fatal cases of measles 4 were reported from Liverpool, and in the same week 5 from Belfast. Of the 25 fatal cases of whooping-cough outside London 4 were reported from Birmingham and 2 each from Manchester, Preston, Bradford, Doncaster, Middlesbrough, and Sunderland, while Glasgow reported 5 that week. Of deaths from diarrhœa Liverpool reported 9, Hull 5, and Nottingham 4, while Glasgow and Dublin reported 6 each.

The number of stillbirths registered during the week was 244 in the great towns (corresponding to a rate of 37 per 1000 births), including 49 in London.

EXTENSION OF ST. BARTHOLOMEW'S HOSPITAL.—The annual report of the treasurer, Lord Stanmore, records the expenditure of over £60,000 upon the purchase of contiguous sites and premises which may eventually be needed for extensions. The new surgical ward block and operating theatres are in course of construction at a cost of £177,000, of which £85,000 has been received or promised. On recreation rooms for the nursing staff £13,000 is being spent. The income of the hospital last year was £194,948, of which £36,000 was derived from receipts on account of patients; the expenditure was £196,000, an increase of £14,000 over the preceding year. On the average in-patients stayed 21 days and cost £15 8s. 2d. each. The new out-patients numbered 75,000 and cost 13s. 6d. each. The nursing staff numbers 330.

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* The Returns printed on page 469 of our issue of Sept. 1st were incorrectly dated August 11th. The date should have been August 18th.

Cambridge.

The percentage of children requiring treatment (7 per cent.) is remarkably low in Cambridge compared with the rest of the country, and the fact that it is higher in 1927 than in the previous seven years is probably due to more stringent marking. On the other hand, the tuberculosis figures for Cambridge are high—38 cases were notified for pulmonary tuberculosis—that is nearly 2 per cent. of those seen at routine inspection, the usual figure for England and Wales being about ½ per cent. The open-air school about to be opened may do much to combat this high incidence. The proposed school will not be quite of the usual type, since it is to accommodate 120 physically defective and also 30 mentally defective children. Previously there were no special schools, and the exact type of child taken into the class for backward children is not specified. Dr. A. J. Laird gives a table showing the steady decline of cases of ringworm in the borough over a period of 14 years.

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Pathology of the Nervous System.

Nouveau Traité de Médecine. Fasc. XVIII. Pathologie du système nerveux; sémiologie générale. By Various Authors. Paris: Masson et Cie. 1928. Pp. 812. Fr.85.

The present volume of the elaborate Treatise of Medicine appearing under the editorship of Prof. G. H. Roger, Prof. F. Widal, and Prof. P. J. Teissier contains a number of articles on the general symptomatology of the nervous system, from the pen of a series of distinguished French and foreign neurologists. Three of the authors—Prof. Karl Petren, Madame Dejerine, Dr. Charles Foix—have not lived to see their contributions in print. Taken as a whole, the volume adheres to the accepted doctrines of the French school of neurology, and in some respects, we consider, is not so up to date as it might be. The article on apraxia (Dr. J. Lévy-Valensi) repeats the rather artificial distinctions of Liepmann, based on the no less artificial generalisations of Wernicke. That on the aphasias, by the late Charles Foix, opens with the fear that to understand aphasia completely passes our ordinary comprehension and powers, and that in spite of its progress neurology will never attain the desired end. It may be so, but at least with the help of psychology some advance on the present situation can be expected; yet the article in question follows the clinico-pathological method too slavishly to be of outstanding value. The sections on the pathology of sleep are regrettably brief and frankly insufficient; as far as we have observed the word narcolepsy is not mentioned. Whether the psychopathologist of to-day will be impressed with the chapters on "Les Grands Syndromes Psychiatriques" may be doubted; they take little cognisance of the developments of modern psychopathology on the basis of psychological analysis, and, being almost entirely descriptive, are unsatisfactory from the viewpoint of ætiology and pathogenesis.

Such criticisms, it may willingly be conceded, do ot detract materially from the many excellences of ie book; the long articles on disorders of motility, sensibility, and in the domain of the reflexes, are a high standard. The chapter on the cerebro-inal fluid, by Prof. J. A. Sicard, is, as might be -pected, admirable.

The Extra-Ocular Muscles.

A Clinical Study of Normal and Abnormal Ocular Motility. By Luther C. Peter, A.M., M.D., Sc.D., Professor of Ophthalmology of the Medical Department of Temple University, &c. London: Henry Kimpton. With 98 engravings and 5 coloured plates. 1928. Pp. 294. 18*s*.

After giving a full account of the anatomy and physiology of the external eye muscles and of binocular vision, Prof. Peter devotes fully one-quarter of this book to heterophoria, a subject which American oculists have made peculiarly their own. Elsewhere the importance of any considerable want of balance between the vertically moving muscles is well recognised, but it is generally thought that lateral errors require treatment comparatively rarely. By far the commonest lateral error is exophoria, of which Dr. Peter says: "There are few patients who will not experience discomfort with more than two diopters (prism-diopters) for distance and more than three diopters at the near-point." The treatment he advocates consists mainly in prism training by means of rectagonal prisms held before the eyes base out. The training is continued at home with increasingly strong prisms until the patient is able to overcome the displacement produced by a prism of 70 diopters base out, a faculty which can only be attained after much practice. In esophoria, on the other hand, the author's experience is that prism training is disappointing." Nor is much good likely to come of ordering prisms, base out, for constant wear. When the patient is hyperopic, the main reliance must be placed on the correction of the refraction to as complete a degree as the patient will tolerate. Cyclophoria is usually connected with oblique astigmatism, and the accurate correction of this by glasses will in most cases abolish it. The rest of the book deals with concomitant squint, paralytic squint, and nystagmus. For training the fusion faculty the Worth amblyoscope is used either as a preliminary to operation or when possible without it. The author disagrees with those who wait until the child is 12 years old and operate under a local anæsthetic. He advocates early operation under a general anæsthetic when necessary.

There is little or nothing in the work about the details of surgical technique, but in other respects this book gives a good account of the causation and treatment of squint and its allied conditions.

The Early Diagnosis of the Acute Abdomen.

Fifth edition. By Zachary Cope, B.A., M.D., M.S., F.R.C.S., Surgeon to St. Mary's Hospital and to the Bolingbroke Hospital. London: Humphrey Milford, Oxford University Press. 1928. Pp. 244. 10*s*. 6*d*.

The successful treatment of acute abdominal disease depends more than anything else upon early diagnosis. Mr. Cope's book places in the hands of the busy practitioner the means to acquire easily such knowledge as will enable him to distinguish abdominal complaints demanding surgical remedi Five editions within seven years can only mean th the author has supplied a real need. The descriptio of diseases and methods are vivid, terse, and simple emphasis is laid upon essentials which stand ou clearly in the mental picture aroused in the reader' mind. Minor revisions in each edition have adde to the value of a book which is likely to remain as popular as it always has been.

A Manual of Physics.

Third edition, enlarged. By Hugh C. H. Candy, B.A., B.Sc., F.I.C., Lecturer on Chemistry at the London Hospital Medical College; late Arnott Professor of Natural Philosophy in Queen's College, London. London, Toronto, Melbourne and Sydney: Cassell and Company, Ltd. 1928. Pp. 487. 7*s*. 6*d*.

The author's Manual of Physics first appeared in 1911 and has been used by a large number of medical students since then. In its third edition it bec rather bigger volume and well covers the required for any pre-medical examination in subject. The author, in view of the introducti the subject of the kinetic theory of gases int syllabus of the Conjoint Board, has given account of this theory. Most medical students find this theory difficult to grasp, and we trust examiners will not really expect candidates to mastered its details.

The subject matter in the book is clearly sented and the illustrations are well selected. colour plate of spectra as the frontispiece shou prove a valuable map of reference to the medic student in his later studies.

Reviews and Notices of Books.

PHYSICAL DIAGNOSIS.

By CHARLES PHILLIPS EMERSON, A.B., M.D., Professor of Medicine, Indiana University School of Medicine. London: J. B. Lippincott Company. 1928. Pp. 553. 35*s.*

IT has always been difficult for authors to define the scope of the term which Prof. Emerson has chosen as the title of this volume. It is continually dinned into our ears that our fathers before us made their diagnoses without the adventitious aids which we now possess, but those who sing the previous glories of a golden age of medicine forget that the assistance of such aids has always been sought when available; at one period horoscopes were all the rage and the position of the planets more important than that of the fragments of a broken limb; the stethoscope was once regarded as a deplorable innovation, likely to destroy all the finesse of diagnosis. The stethoscope, the ophthalmoscope, and even the sphygmanometer have now been generally accepted as clinical aids; there still remain those who regard a microscope or a test-tube with suspicion.

Prof. Emerson is not in this group, but in his preface he does make a valiant effort to separate "physical" diagnosis from the other sort, whatever that may be. The effort has been made before and will be made many times again, but the result can never be quite satisfactory. The diagnostician will make use of such methods as he considers likely to assist him to his goal. These may comprise the exercise of palpation, the use of a thunder-box, the examination of a blood film, or the casting of a horoscope. Any of them may be supposed to constitute aids to diagnosis; but the art remains obstinately indivisible, and efforts to split it by definition are never satisfactory, since assistance which is scorned to-day may be recognised to-morrow as indispensable. Yet Prof. Emerson has produced a book both valuable and important, larger than most works of its kind, and packed with sound and interesting information. It is doubtful if "Ellis's S-shaped curve of dulness" ever afforded much information not available by the use of an exploring needle, and even Grocco's triangle is usually identified after the diagnosis has been established. But the author is an instructive guide, with a keen historical sense, and an ardent desire to impart information as to early diagnostic technique. It is good for a medical man of this generation to understand the steps by which the methods he uses daily at the bedside were developed, and to contemplate the difficulties which faced his forebears, though it may lead him to be thankful that he has no need to rely solely on his own powers of observation, and can call in help not available to them.

The illustrations are excellent, those in the section on the skin almost constitute an atlas of diseases of the integument, and the diagrams are clear and instructive. The book deserves a wide popularity among students and medical practitioners alike.

A TEXT-BOOK OF GYNÆCOLOGY.

By JAMES YOUNG, D.S.O., M.D., F.R.C.S.(E.), Physician, Royal Maternity Hospital; Assistant Gynæcologist, Royal Infirmary, Edinburgh. London: A. and C. Black. 1928. Pp. 338. 15*s.*

THE second edition of this text-book has been completely revised and alterations made to bring it into line with recent discovery. The section on the ovary and the relation of its cyclic changes to menstruation has been rewritten. The exposition of this part of the subject is now thoroughly up to date and is the best with which we are acquainted in any of the smaller text-books, as might be expected from an author whose own contributions to the physiology of menstruation have been so noteworthy. A brief section on endometrioma has been added, though a clearer account of the work of J. A. Sampson would probably have added to its value. Perhaps the author will consider whether, in a future edition, the chapter on "endometritis" should not be considerably modified so as to bring it into line with the most recent views. Chronic metritis is described as synonymous with "fibrosis uteri," and although if this change were present it would be adequate to explain the chief symptom from which the patient suffers, it does not represent the true pathology in the majority of cases. Myomectomy and hysterectomy are the only alternatives recommended for fibroids that have undergone necrobiosis during pregnancy, whereas experience shows that with expectant treatment most of these cases settle down and go on to term. The final short chapter on minor gynæcological procedures is a most useful one, for it gives a concise account of such procedures as vaginal douching, application of tampons, upon which the student is apt to have rather hazy ideas. This book can be thoroughly recommended to the practitioner and to the student preparing for his final examinations. It gives clearly what he wants to know, with the minimum of unnecessary detail.

MODERN MEDICINE, ITS THEORY AND PRACTICE.

Edited by Sir WM. OSLER, M.D., F.R.S., THOMAS MCCRAE, M.D., and ELMER H. FUNK. Vol. VI. Diseases of the Nervous System—Diseases and Abnormalities of the Mind. Third edition. London: Henry Kimpton. 1928. Pp. 964. £12 12*s.* per set.

SOME unevenness is to be expected in a work containing contributions by a number of authors, but it is exceptional to find in a text-book of the standing of Osler and McCrae's Modern Medicine such grave inadequacies and inaccuracies as are present in its sixth volume, that on diseases of the nervous system, of which the third edition has just been published. Some of the articles in this, at once be it said, are unexceptionable. It would be an impertinence to praise Dr. Harvey Cushing's contributions on "Cerebral Tumour" and "Hydrocephalus"; the editors may be congratulated on having induced Dr. Cushing to put his unique experience within easy reach of the general practitioner and the medical student. The articles by Dr. Gordon Holmes, Sir Farquhar Buzzard, and Dr. C. P. Symonds leave nothing to be desired. But, at the other extreme, we cannot but condemn an article on subacute combined degeneration of the spinal cord in which the statement is made that "the blood changes so commonly found in these cases are more often of the nature of a secondary anæmia than of the pernicious variety," in which gastric achylia receives no mention, and nothing is said concerning treatment by the administration of acids or a liver diet? The section on intracranial aneurysms is an abstract of an article on this subject by Beadles, published in 1907. It contains no reference to more recent work, no mention of the congenital or embolic origin of such aneurysms, and no adequate account of the clinical picture which follows leakage of blood from the aneurysmal sac. The writer who deals with trigeminal neuralgia has clearly no personal experience of treating these cases by alcoholic injection of the Gasserian ganglion, or so at least it is to be hoped, for he states that after the first injection two or three more are given within a week to complete the treatment, and that following the injection the pain is relieved in "three or four hours." No description of the technique of these injections is given. There is unconscious humour in the mis-statement that tennis elbow is an occupation neurosis, and in the quaint juxtaposition in one chapter of astasia-abasia and adiposis dolorosa. The inclusion in one chapter, under the title Scleroses of the Brain, of disseminated sclerosis, pseudo-sclerosis, and tuberous sclerosis, three conditions which have nothing in common but

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 8, 1928.

SCIENCE AND CRAFTSMANSHIP.

In reflecting on the miserable conditions under which our primitive ancestors must have survived William James has remarked somewhere that it is characteristic of man that he prefers life on any terms to no life at all. It is equally characteristic that he makes every effort to improve his circumstances, and if by "craftsmanship" we mean the skill which is exercised in the production of whatever is wanted for human welfare, then craftsmanship represents in a summary way man's effort to live. Such is the meaning which Sir William Bragg puts on the word in his presidential address delivered before the ninety-eighth meeting of the British Association for the Advancement of Science, which was opened at Glasgow on Wednesday, Sept. 5th. Prof. Bragg has charmed many audiences at the Royal Institution with his explanations of and commentaries on the intimate relation between modern scientific knowledge and the empirical practice of old artificers, and the burden of his present discourse is that scientific training and scientific method provide the craftsmanship of modern industry. There is a cult which exalts the beautiful and efficient implement made long ago by hand, singly and painfully, to a level which is wholly denied to the products of the machine tools and factories of to-day—a cult which often misleads itself by thinking that the average excellence of past production is fairly represented by the examples of old work which owing to their exceptional quality have survived for us to see and use.

With such a point of view the President of the British Association has very little sympathy; he sees that the mass conditions of to-day demand for success just that same combination of imagination, intelligence, and manipulative skill which was needed when man was groping his way through the early stages of the development of what Samuel Butler so aptly calls detachable limbs. Conditions have changed because what is knowable has outgrown the capacity of one human mind to know, and specialisation has come in with, as always, some tendency to disintegration. The intelligence and imagination of modern production are now largely derived from those who pursue natural knowledge, and progress in invention depends on the progress of science and the degree to which use is made of its discoveries in the practical world. Leonardo or Réaumur are impossible to-day, but there is no reason why science and technology should not achieve equal triumphs if they can coöperate with such free friendliness as takes no count of status or credit, if only the common good is achieved. Empiricism is not the prerogative of technology, nor coherent knowledge of natural science. The wave theory of light is good because, in some relations, it works; the electrical theory is also good because it also, in other relations, works. And no one so far has had the wit to see how the two theories may be reconciled. That such a state of affairs should prevail in the branch of natural knowledge which has made the most notable progress in the last 50 years testifies alike to the common humanity of science and to the field which it offers for intellectual adventure. In its applications to industry the opportunities for adventure are no less. "Thou shalt love the Lord thy God with all thy heart and with all thy soul and with all thy strength" means to the student of science that he is to put all he is into his work, knowing that every attempt to understand the world he lives in is worth while. And if he writes up, "Sirs, ye are brethren" as well, he will help his fellows all the better.

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THE LATE RESULTS OF BREAST SURGERY.

Now that operation as the method of choice in treating cancer of the breast is being seriously challenged by the supporters of radium therapy, Dr. Janet Lane-Claypon's survey[1] of the late results of various kinds of operation for growths at different stages is opportune. She has here freed the literature of breast surgery from the reproach, exposed by her previous analysis (No. 33 of the same series of grey books), that most of the statistics published are based on a follow-up after operation of only three years, which period she found to be the average duration of life in untreated cases. Surgeons will be gratified, if hardly surprised, to learn that on the whole the impressions derived from short periods of observation are confirmed; the lasting success of the Halsted technique or one of its modifications depends almost entirely on the stage of disease at which it is performed. The basis adopted by Dr. Lane-Claypon for calculating results is that of the net survival rate—that is, the proportion of survivors to those operated upon, after deducting entirely from the sample those not traced and also those certified as having died from causes other than cancer. Early cases, where the primary growth was undoubtedly malignant but microscopical examination showed no invasion of cancer glands (Group IP.) show the remarkably high survival-rate, ten years after operation, of 73·3 per cent. This rate includes *partial* operations, and rises to 77·2 if only those cases submitted to radical operation are included. In many other respects — such as the mean lowered fertility in the history, delay in seeking treatment, and the good functional results after removal of the pectoral muscles—the commonly accepted teaching is also confirmed. It is profitable, however, to examine this exhaustive study in order to ascertain in what respects the conclusions reached differ from those generally held. The lessons that the clinician may learn through the massed results from eight important county boroughs are noteworthy.

Broadly speaking, it seems that the clinical criteria of malignancy of a primary growth are reliable and need no revision. At least this is the deduction to be drawn from the direct evidence afforded by 364 cases where the diagnosis was not confirmed by a pathological report on the primary growth. The results following operation on these cases have been considered separately and have been if anything slightly worse than those of the confirmed cases. Indirect evidence, on which Dr. Lane-Claypon lays considerable stress in a closely written argument (Chapter 13), is less flattering to the clinician. Among the total number of cases in the survey there were 380 in which the malignancy of the primary growth was established histologically, though neither pathologist nor clinician could find any trace of invasion of the axillary glands; 370 of these were classified

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[1] Reports on Medical Subjects, No. 51. Report on the Late Results of Operation for Cancer of the Breast, being an Analysis of 2006 Cases occurring in the Practice of the General Hospitals of Eight County Boroughs of England and Wales during the period 1910–1921. London, 1928, Ministry of Health, H.M. Stationery Office. Pp. 143. 3s.

A WEST INDIAN PEPPER-POT.

By T. R. ST.-JOHNSTON. With coloured illustrations by EVA WILKIN. London: Philip Allan and Co. 1928. Pp. 209. 10*s.* 6*d.*

THE Colonial Secretary introduces Colonel St.-Johnston's new book to the public, pointing out that slowly, but steadily, after long years of seclusion and stagnation, the West Indies are returning into the Imperial picture. Mr. Amery, therefore, holds that anything which tells us of the life of the general community in the West Indies is to-day worthy of attention. Colonel St.-Johnston, as the Administrator of St. Kitts-Nevis, is able to write from first-hand experience. And this experience he uses with skill and humour in 13 "Quashie" stories, "Quashie" being a sort of generic slang term for the West Indian peasant, as "Taffy" is for a Welshman, or "Pat" for an Irishman. Some of the stories are sensational, some are mystical, and some are both, and all help to set before us, as they are, an agricultural people in districts where agriculture reigns supreme, and where the Christy Minstrel type is non-existent. The illustrations are bold examples of modern colour-printing, and convey well the spirit and the messages of the stories.

MEDICAL VIGNETTES.

By T. F. DEWAR, C.B., M.D., D.Sc. Glasgow: Alex Macdougall. 1928. Pp. 73.

DR. DEWAR has republished a series of sketches first issued in the *Caledonian Medical Journal* and, in one instance, in *Chambers's Journal.* They are all well written, and many of the incidents form the right material from which to construct an episodal note or story. If this may be said especially of those which tell of occurrences during the war, the other vignettes have for the most part a message which was worth delivering—some medical lesson, perhaps of large significance, illustrated by a small every-day happening.

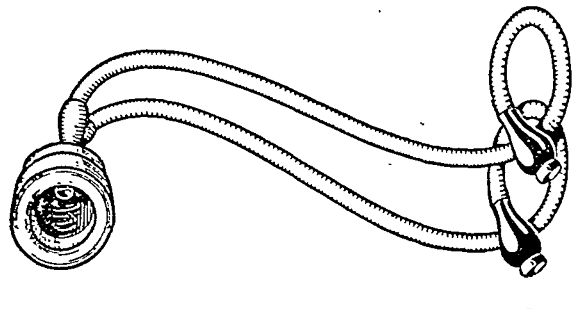
JOURNALS.

ANNALES DE MÉDECINE.—The June number is devoted to neurology under the direction of Prof. Guillain. The first article is a lecture given at the Salpêtrière by Dr. A. F. Hurst on Subacute Combined Degeneration of the Spinal Cord and its Relation to Pernicious Anæmia. Even though at the onset of the spinal symptoms no anæmia may be present, nevertheless the red blood cells show the increase in their average size which is characteristic of pernicious anæmia, and gastric achlorhydria is always present. Achlorhydria is the most important ætiological factor, since, in the absence of free HCl in the stomach, streptococci gain entrance to the bowel, and hence their toxins gain access to the blood and nervous system. Subacute combined degeneration is usually a consequence of a constitutional achlorhydria, but has also resulted from that of gastric carcinoma and of chronic alcoholic gastritis. Liver treatment, though it cures the anæmia, has, by itself, no influence on the progress of the spinal disease.—In the next article Guillain, Alajouanine, Bertrand, and Garcin describe a case of acute myelitis with optic neuritis. One of its peculiarities was the occurrence of a focus of degeneration in the sub-thalamic region, and this manifested itself clinically by frequent tonic crises resembling tetany, affecting the limbs of the opposite side to the lesion. In the eight months of its duration the illness showed several remissions and exacerbations; the first attack caused spastic symptoms and severe pains; the second, a month later, gave rise to the tonic fits; the third, three months later, left the patient blind; and the fourth, a few weeks afterwards, produced a state of flaccid paralysis and led up to the fatal termination. Detailed examination of the nervous system after death showed extensive foci of acute necrosis in the spinal cord, a focus in the subthalamic region, and another in the optic chiasma. The ætiological relationships of the disease are discussed.—Guillain and Thevenard, in a subsequent article, on the subject of Extracortical Jacksonian Epilepsy, describe four cases with typical Jacksonian attacks in which no lesion of the cerebral cortex at the site indicated by the attacks was found at operation or post-mortem. They associate these cases with those described by Spiller as subcortical epilepsy.—Guillain and Garcin contribute an important article dealing with the syndrome of paralysis of all the cranial nerves of one side; this is always due to sarcoma of the base of the skull and yet there are no signs of increased intracranial pressure nor of invasion of the brain by the growth. Three personally observed cases and one from the literature are given. The lesser syndromes resulting from injuries of groups of cranial nerves at their various foramina of exit from the skull are also briefly discussed.—Guillain and Alajouanine, in the next article, draw attention to the occasional occurrence of somnolence as a symptom of desseminated sclerosis; it always occurs in an acute phase of the disease, and may give rise to difficulty in the differential diagnosis from encephalitis lethargica.—In the last article Bertrand and Hadzigeorgiou describe their technique for using infra-red rays in the microscopic study of the nervous system; photographs are taken on specially sensitised plates and must be developed in complete darkness. The effect of the long wave-length of the infra-red region is that there is little dispersion by the particles of the tissue and the power of penetration is consequently very great; refraction is practically avoided by cutting out all waves less than approximately 700 λ. Neuroglial elements and the intracellular structure of ganglion cells are remarkably well revealed by this method of examination.

New Inventions.

AN IMPROVED STETHOSCOPE.

WE have contrived and been using for some time an instrument which combines the handiness of the pocket phonendoscope with the clear transmission of the wooden stick stethoscope. As is shown in the illustration, the ear pieces are separate and made to twist well into the ears where they remain firmly in place. The chest piece is of light composition, very durable, and causes no such pull on the ears as does the usual heavy phonendoscope. The lumen of the transmitting tube is constant throughout, and by tapering at the joints between the tube and the chest and ear pieces all dead space for "backwash" is eliminated. The chest piece is protected by a rubber cap to ensure comfort for the patient and added clearness for the transmission. The essential distinctiveness of the instrument is its exceptional conduction and handiness for carrying about. It has the additional advantage of selling at a moderate price.



The stethoscope is made by Messrs. R. Sumner and Co., Ltd., 40, Hanover-street, Liverpool.

J. KILPATRICK REID, M.B., Ch.B. Liverp.
W. OWEN MORRIS, M.B., Ch.B. Edin.

In a statistical study of the efficacy of artificial pneumothorax (A.P.) treatment, E. RIST and F. HIRSCHBERG[1] have endeavoured to ascertain the percentage of cures in a series of cases treated at the Laënnec Hospital by comparing the after-history of patients so treated with that of others who did not submit to a similar course. The authors point out that the ideal method would have been to select a series of patients suffering from the same type of disease, to treat half the cases with A.P., and to deny this treatment to the remainder. Humane considerations made this impossible. It was, however, possible to divide a series of patients into two classes, those willing to receive A.P. treatment and those unwilling or unable to do so. The classes were not strictly comparable. Many of those who refused the treatment were probably persons of low intelligence or lacking in determination. for whom the prognosis is usually unfavourable. In others the presence of adhesions which rendered treatment impossible may have indicated some difference in the type of disease. In the main, however, a fair comparison can be made between the two groups.

The patients selected by the investigators for the study were suffering from unilateral disease, tubercle bacilli were constantly present in the expectoration, and in each at least half a lobe was shown by radiogram to be affected. 759 in number, they included all cases of this type treated between 1912 and 1926. The controls were 463 patients who did not receive A.P. treatment, either because adhesions prevented collapse of the lung or because such treatment was refused. At the end of the period under review 52 per cent. of the treated patients were " clinically healed," free from symptoms, no longer expectorating tubercle bacilli, and able to lead a more or less normal life; 32 per cent. were dead, and the remainder either unbenefited or worse. Approximately 54 per cent. of the controls had died. If the number of patients exhibiting signs of progressive disease be added to the deaths, the advantage of the treated cases is still more apparent, as the percentage for the former is 44 while for the latter it is 82. It is noteworthy that while many of the clinically healed group were able to work, and all had ceased to expectorate tubercle bacilli, none of those who had refused treatment was fit for employment, and most in this group were still infectious. As this first study included patients who had only recently commenced treatment, the ultimate result of which could not be known, a further investigation was carried out on a group of cases first seen between July 1st, 1919, and July 1st, 1921. A period of seven years is thus available for review. The figures obtained again demonstrate the great value of collapse therapy. The percentage of the controls who were dead by the eighth year is 90, thus being more than twice as high as the figure for the treated cases. At this time 35·8 per cent. of the treated cases were classed as healed. None of the untreated cases had recovered and none was capable of work. Among the treated cases nearly 50 per cent. of the deaths occurred in the first two years following induction. After this period the mortality-rate fell, and no deaths were recorded after the fifth year had passed.

Drs. RIST and HIRSCHBERG consider that the word " cure " should not be allowed until three years have passed during which there has been complete freedom from symptoms and an absence of tubercle bacilli from the sputum. At this stage the question of abandoning the refills may be considered. After the fifth year the danger of relapse is small, and in many cases it is desirable to maintain pulmonary collapse till the completion of five years after induction. The female mortality among both the treated and the untreated cases greatly exceeded that of the males. Thus in the first year of treatment a female mortality of 26·8 per cent. was contrasted with a male mortality of 6·3 per cent. They attribute this special susceptibility of women to an inferior power of resistance, the result of the legal and economic inferiority of women which is still maintained in France by legal enactments and social institutions. The ages of the patients are not given, but from the type of cases selected for treatment it seems possible that the majority belonged to the early adult group. A high female mortality-rate is characteristic of this group in countries where women enjoy equal legal and social advantages with men. Unfortunately, nature cares nothing for sexual equality, and it is probable that physiological rather than social disabilities account for the more disastrous effect of tuberculosis among women in the earlier years of adult life.

Annotations.

"Ne quid nimis."

THE VITAL RECORD OF ENGLAND IN 1927.

WE gave in our last issue (p. 459) some of the outstanding figures of general and specific death-rates in England and Wales for 1927, as set out in Part I. (Medical Tables) of the Registrar-General's Review for that year. While awaiting the Text of this Review, which may be many months in coming, it is possible to make some comparisons of 1927 with the experience of previous years. The lowering of the birth-rate and of the rate of infant mortality have already been noted. As is well known, the lowered birth-rate is producing an altered distribution of the population according to age which ere long must lead (*ceteris paribus*) to a stationary or to an increasing crude death-rate at all ages, and it is not surprising, therefore, to find that this rate, which at all ages averages 15·4 in 1901–10 and 12·2 in 1921–25, has only declined to 11·6 in 1926 and 12·3 in 1927. This is the case, notwithstanding the fact that in successive periods of life, right up to 75, the death-rate per 100, living at each age was lower in 1927 than in 1906–10. The Review enables each medical officer of health to ascertain his official position in regard to infant mortality as compared with that in other sanitary districts. We have once more to draw attention to the contrast in respect of death-rate in infants under 4 weeks of age in different parts of the country. In London during 1927 the death-rate during these four weeks was 24·4 per 1000 births, but it was 34·5 in the aggregate of all county boroughs. A study of detailed causes of death, as stated in the tables of the Review, gives some imperfect idea of the extent to which this mortality was preventable in character. The excessive mortality occurred chiefly in the North of England and in Wales; nor in these more rugged regions was it confined to the large centres of the population, but characterised also their rural areas. Table XIII. in the Review makes a more detailed comparison possible. Thus, comparing county-boroughs with each other, the following extremes are noteworthy. At ages under 4 weeks the death-rate in Blackpool, Newcastle, and Sheffield was 40, in South Shields it was 42, in Dudley, Swansea, and Huddersfield 44, in Gateshead 46, in Oldham and in Preston 47, and in Burnley 49, while in Bath, out of every 1000 born alive, the number lost under 4 weeks only numbered 20, in Bootle 25, in Brighton and Croydon 26, and in Eastbourne only 17. The possibilities of preventive medicine for this early period of infancy are far from exhausted.

Table VI., comparing the incidence during a long series of years of the death-rate from the chief infectious and general diseases, is always of great interest. It is noteworthy that the death-rate from total tuberculosis for two years in succession has been well below 1 per 1000 of population, and there is no indication that the limits of decline—if they exist—are being approached. Encephalitis lethargica unfortunately maintains its place in the list of causes of death; and it is not without interest to compare its magnitude with that of enteric fever which no longer in a table according to the operation performed, nine being discarded because the exact technique used was not recorded, and one for no stated reason. The five operating methods used were: 1 (244 cases), radical operation; 2 (45 cases), two operations—that is, removal of tumour or breast for pathological report, followed by radical operation at a later date; 3 (28 cases), removal of the breast, together with such of the axillary contents as could be taken without removing the pectorals; 4 (18 cases), amputation of breast only; 5 (35 cases), removal of tumour only. Dr. Lane-Claypon gives her reasons for considering that where methods 2, 4, and 5 were chosen—that is, in 98 cases—there must have been an original error in clinical diagnosis. In none of them is there a note of either a preliminary incision or a frozen section, and in several instances the first operation was performed in the out-patient department or by the patient's own doctor. From these and other considerations she assumes that the practitioners were reasonably satisfied as to the innocence of the growth. In one of the 45 cases where method 2 was used, duct papilloma had in fact been recorded, in another chronic mastitis, while 11, diagnosed as suffering from cysts, had in fact cysts, with small foci of cancer cells in the wall or in an intracystic papilloma. Incidentally, these cases provide instructive examples of the different microscopical appearance to be found in different parts of the same breast, to which Sir Lenthal Cheatle has drawn attention, and support his contention that a pathological report confined to the obvious tumour may be highly misleading. Statistically, the method of two operations gives results nearly as good as does radical operation at one sitting, but since a second operation is sometimes refused and much distress of mind often occasioned, it is recommended that in all cases tumours should be removed under such conditions that the surgeon can proceed at once to the larger operation if he thinks it desirable. Leaving for the moment consideration of method 3, we note that pathological reports on the 53 cases in which methods 4 and 5 were used indicate that the growth was very early. In 20 of them the clinical diagnosis was definitely that of an innocent condition, and it may be assumed that no surgeon would do such a very limited operation in the face of a suspicion of cancer. The data supplied in this report does not show the converse side of the picture—how many persons have had a radical operation for a benign growth. This may be relatively unimportant to those chiefly concerned with the public health, but the practitioner considering drastic operation for a doubtful tumour might pertinently ask the question. An educated patient who has been persuaded to have breast and pectoral muscles removed may await the pathologist's report with keen apprehension, but her relief when she hears that her tumour was a benign growth may well react on her faith in her medical adviser, especially if hers is one of the rare cases where the functional results are indifferent. It is possible, too, that when women are trained to report any swelling of the breast to their doctors immediately they notice it, the difficulty of clinical diagnosis will be greatly enhanced since the chief criteria of malignancy with which every student is familiar may not be apparent in really early cases. This is a bogy that need not yet cause alarm, for, unfortunately, the doctor rarely sees the disease at its inception, and the malignant nature of a primary growth is probably diagnosed more successfully in the breast than in any other situation.

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[1] Paris Médical, 1928, i., 17.

The clinical estimation of the invasion of axillary glands is, apparently, far less satisfactory, and it is obvious that at an early stage of invasion these glands are not palpable. In Chapter 6 of her report Dr. Lane-Claypon shows that while positive findings are for the most part confirmed by histological examination, palpation is quite unreliable as a method of assessing the condition of these glands. Of the 169 cases in which examination at the bedside gave negative results, 90—or 53 per cent.—were incorrect. The import of this grave error is best seen in regard to the selection of operation. The third method in Dr. Lane-Claypon's list consists of removal of the breast together with such of the axillary contents as can be taken without removing the pectorals, and has evidently been chosen by the surgeon in the mistaken hope of saving from the radical operation those patients in whom the axillary glands are deemed to be normal. The fate of patients operated on by this method is, as Dr. Lane-Claypon puts it, surprising and very deplorable, being much worse than that of those in whom either breast or tumour only was removed. The survival-rate after method 3 in the group of cases showing no clinical evidence of invaded axillary glands is lower at all periods after operation even than the rate of the advanced group where the glands were definitely palpable. There is, moreover, reason to believe that the cases operated on by method 3, far from being advanced, were considered to be so doubtfully malignant as to be suitable for a conservative operation. The conclusion reached is that the terrible results are due to the rapid spread of the growth following incision into axillary tissue which contained undetected cancer cells, and that this operation should never be performed. Evidence that clinical palpation of the axillary glands is not reliable has another bearing not mentioned in the report. Some surgeons of the younger school are inclined to despair of the possibility of eradicating the disease if the axillary glands are already palpable, and are inclined to remove the breast only as a palliative measure. We call their attention to the fact that positive results of axillary palpation, though more accurate than negative ones, are too pessimistic in 17 per cent. of cases, and that the survival-rate after ten years, even of the group where glands are easily palpable, is by no means negligible if radical operation is performed.

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COLLAPSE-THERAPY IN PULMONARY TUBERCLE.

Nearly half a century has elapsed since the first tentative experiments in collapse therapy were made, but it is only in the last 25 years that the method has been generally employed. In that period the treatment of pulmonary tuberculosis by artificial pneumothorax has saved more lives than all the other methods of treatment added together. By its means those who would formerly have been regarded as incurable have regained health, and the dying have been restored to life. Time, which has seen the rising and setting of innumerable "cures," has only established more firmly the value of pneumothorax. Unhappily, only a minority of the afflicted can benefit by this method of treatment. Those suffering from bilateral disease may obtain a measure of relief from artificial pneumothorax, but in their case only temporary benefit can, as a rule, be expected, while probably more than half of the unilateral cases are unsuitable on account of adhesions which bind the lung to the chest wall and prevent efficient collapse. The greatest triumphs of collapse therapy have been obtained in the case of patients in whom the disease is limited to one lung and in whom the pleura is free. If these conditions are present, complete and lasting cure may be anticipated in a proportion of cases availability of suitable transport, the means of rapid loading and dispatch, the adequacy of roads free from a crowding exodus of other citizens, and the facilities for light and water will materially affect decisions on this important point. I believe, and others share the view, that each medical officer of health should in consultation with the local profession and the hospital authorities have ready and prepared a series of schemes suitable for various contingencies such as prevalent wind, extent of attack, and numbers of persons affected. These schemes should be known to all concerned so that the broadcasting of a code word will immediately set in operation an orderly sequence of events." This implies that the time has come for all ambulance workers to be trained in anti-gas drill, all drivers of emergency transport to be similarly instructed, and all doctors and nurses to know what is expected of them, and it is hard to say that it is more unreasonable to prepare for air attacks which may never come than to have fire drills in buildings where fires are not likely to occur. When we are told that these things can go forward without unduly alarming the civil population in the same way as measures are taken quietly to deal with possible outbreaks of infectious disease, we do not agree. while certainly it will be hard to raise enthusiasm for measures which may never be needed. But such precautions would offer no provocation to other nations, a criticism which can be levelled against offensive preparations. They would show that having realised a possible and serious danger we are taking the apposite measures.

TISSUE IMMUNITY.

By republishing in book form various contributions to medical journals and conferences which he has made since 1898, Alexandre Besredka has summarised 30 years of work of research on immunity from the preventive and curative side of vaccine therapy. We use this term in its widest sense. Some of the earlier chapters of the book awaken memories of "battles long ago"—Metchnikoff and phagocytosis, the diversity of the streptococcal species, antistreptococcal serum and others. But perhaps the most interesting of all the numerous subjects which the author treats in his clear and lucid style are the later ones which deal with his now well-known theories with regard to clinical immunisation by the cutaneous, buccal, and intestinal portals of entry. Prof. Besredka's method of immunisation by the sensitisation of the gastro-intestinal tract with bile previous to the ingestion of vaccine or anti-serum is now well known. In France, where prophylactic typhoid vaccine is extensively administered in this way, the method may be said to have passed the experimental stage. A considerable amount of statistical evidence of its efficacy is now available. The method has obvious advantages to make it attractive to the clinician, but the rôle of the bile in gastro-intestinal bacterial infections is only dimly understood at present and there is need for a good deal more experimentation, especially combined team-work of physiologist and bacteriologist, before complete reliance can be placed on the method as a satisfactory alternative to the now well-established subcutaneous inoculation. Laboratory animals, unfortunately, are not entirely suitable for the work and the actual steps of this tissue immunisation, if true immunisation it be, have not yet been worked out, and precisely how far the humoral phenomena of immunity, precipitins, agglutinins, and the like are affected by these methods cannot yet be estimated.

We have dealt at some length on two previous occasions[1] with Prof. Besredka's theories on tissue immunity in relation to the skin and the gastro-intestinal tract. Briefly, he considers that the body defends itself primarily by a local reaction in the tissue through which the micro-organism gains access to the body, and he has elaborated his thesis with numerous experiments with *B. anthracis* and other organisms. Much yet remains to be done before a conclusive opinion can be expressed. No one can look at a histological section of the skin in a case of leprosy without being impressed with the local powers of phagocytosis. Similarly the extensive work of A. S. Griffiths[2] over a long period of years has shown that in lupus there is a frequent modification of the pathogenic properties of the tubercle bacillus which are probably the result of adaptation of the bacilli to the resistant action of the skin. Other examples might be quoted, notably a long series of investigations by A. K. Krause[3] on guinea-pigs with tubercle bacilli. But the histological side of the picture, the questions of absorption and lymphatic drainage, local antibody production, and so on, have not yet been exhaustively explored.

SECOND INFECTION IN SYPHILIS.

Athough a second infection of syphilis in man had occasionally been reported before the introduction of salvarsan, it was only after the use of the arsphenamins had become general that examples became at all frequent. The diagnosis of a second infection is by no means free from pitfalls. The *chancre redux* which appears at the site of the original primary lesion many years later, and may be followed by cutaneous manifestations simulating the secondary stage, is really a gummatous lesion. C. R. L. Halley and H. Wasserman[4] have recently published observations on collected reports of 676 cases of second infection. The majority failed to satisfy the criteria which these authors considered necessary to establish both the first and the second infection. To the 229 examples which were found to be acceptable as true cases of second infection, the authors have added eight cases under their own observation. On analysis 97 per cent. of these cases were found to have received treatment with modern remedies early in the course of the first infection. No example of second infection could be found in cases whose first infection remained untreated until the tertiary stage; only one instance of a congenital syphilitic acquiring a second infection was noted. The rarity of second infection in women (only 3·3 per cent. of the total) is in keeping with the general experience that the majority of women come under treatment at a later stage of infection than men. Halley and Wasserman point out that the number of second infections diminish as the interval between the onset of infection and the commencement of treatment increases. Similar observations have been made in the experimental syphilis of rabbits. Recent researches on immunity in syphilis have shown that reinfection in man does not constitute certain proof of the complete cure of the original infection. The occurrence of superinfection following inoculation with material containing spirochætes in the very early stages of human syphilis and in experimental syphilis in rabbits is also well known. G. Mestchersky and S. Bogdanoff,[5] who have recently reported the effects of experimental inoculation in various stages of human syphilis, achieved results which led them to conclude that superinfection is possible at all stages of syphilis. But the lesions in their successful cases were those of a modified infection; no characteristic primary lesions were produced, nor was there any evidence of generalisation of the infection. Their experiments, like those of Finger and Landsteiner,[6] in which the inoculation with spirochætes of cases in the tertiary stage resulted in lesions of tertiary type, indicate that the tissues are refractory to second infection but that immunity is not absolute. It is of interest to recall that experimental inoculation of rabbits already infected with syphilis is successful in a much higher ago than 1896–1900 was responsible for a death-rate of 176 per million persons living. Compare this with the rates for the year 1921 when separate returns for encephalitis lethargica became available, and for the six subsequent years—

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[1] THE LANCET, 1926, i., 766; and 1927, ii., 73.

[2] Tubercle, 1923, v., 569.

[3] Amer. Rev. Tub., 1926, xiv., 211.

[4] Arch. Int. Med., 1928, xli., 843.

[5] Urolog. and Cutan. Review, 1928, xxxii., 230.

[6] Quoted by A. M. Chesny, Immunity in Syphilis, London, 1927, p. 22.

Enteric fever	16	12	12	13	10	9	9
Encephalitis lethargica	19	9	13	36	34	32	28
Diabetes	90	99	92	87	88	89	95

We have added a column dealing with diabetes, on which a recent report of the Registrar-General contained a valuable study in detail.

A note may be made, in conclusion, on the tables of cases of infectious diseases notified to medical officers of health during 1927 in each sanitary area. It would be interesting to ascertain how many or, rather, how few, medical officers see these tables tucked away in the last pages of a volume for which the non-official purchaser must pay 15*s*. Their public health value is great in reviewing the experience of each year and in comparing this experience with that of other areas: They are valuable finger-posts, indicating where further investigation is needed from an administrative standpoint; and their value as implements of epidemiological research rises year by year. We take this opportunity of emphasising the importance of these tables to every medical officer of health in the country.

THE USE OF WELCHII ANTITOXIN IN ACUTE OBSTRUCTION AND GENERAL PERITONITIS.

THE actual cause of the toxæmia in cases of acute intestinal obstruction and general peritonitis remains obscure, and attempts are continually being made to elucidate it. Gatch, Trusler, and Ayres[1] consider that the toxæmia following obstruction is due to the absorption by a damaged mucous membrane of toxins which would not be absorbed by the normal mucous membrane. Further strangulation ensures the development of an ideal culture medium for the rapid proliferation of pathogenic bacteria, and the gases resulting from putrefaction cause increased pressure within the lumen and so increase absorption. Dragstedt[2] and his collaborators have shown that experimentally closed loops of duodenum or jejunum prove rapidly fatal unless drained from the outside, and further, that if closed loops of intestine are first washed with ether or an astringent wash the obstruction is not fatal to the aninal. All these observers agree that death is caused in cases of strangulated bowel by conditions which increase the absorption of toxins, the actual nature of which toxins being still undetermined. Working in the Clinical Surgical Unit of St. Thomas's Hospital, B. W. Williams[3] attempted to demonstrate the presence of a true bacterial toxin of intestinal origin and to indicate its nature and the conditions of its development. Struck by the clinical similarity between the toxæmia in acute obstruction and general peritonitis, and the toxæmia of gas gangrene, he was led to investigate the development of *B. welchii* in the two first conditions. He showed that there is evidence of immense proliferation of *B. welchii* in the contents of the small intestine of patients with acute obstruction and peritonitis with stasis, and also of the presence of the exotoxin of the organism; the clinical aspects of patients, the occurrence of intravascular hæmolysis, and the microscopical changes in the heart and liver of fatal cases suggest that absorption of toxin has taken place. The truth of his hypothesis appeared to be confirmed by the results of a therapeutic test of *B. welchii* antitoxin at St. Thomas's Hospital in cases of acute obstruction and general peritonitis. A comparison of cases so treated with a control series showed definite lowering of the mortality and alleviation of the symptoms and clinical signs of toxæmia, even allowing for the difficulty of prognosis before treatment and therefore of assessing its results. Following the publication of Williams's paper, Bower and Clark[4] have used *B. welchii* antitoxin at the Samaritan Hospital, Philadelphia, in 25 cases. Eleven of these suffered from acute diffuse suppurative peritonitis, nine had acute intestinal obstruction, and five were cases of acute suppurative cholecystitis, in which the process had extended to the peritoneum or pancreas. In the first and second of these groups the authors were able to substantiate the claims made by Williams. The patients treated with antitoxin were less restless, consciousness was less acute, the pulse-rate was diminished, the temperature was reduced, distension became less, and the intestines were evacuated earlier. Two cases in the third group also appeared to derive benefit from the antitoxin. The small number of cases treated and the wide variation possible in the type of case chosen for treatment by different observers make percentage mortality figures useless for comparison with those from another institution. The fact that workers under quite different conditions have obtained confirmatory results suggests that Williams's hypothesis should be followed up and given further trial, for if surgical treatment of intestinal obstruction can be supplemented by a trustworthy method of combating toxæmia, its high mortality should be considerably reduced.

MEDICAL PROBLEMS IN AERIAL WARFARE.

THE Kellogg Treaty recognises that war is not inevitable, while responsible statesmen must explore every avenue to prevent its occurrence. Almost simultaneously with its signature the aerial manœuvres round London have reminded us that, though the contingency of war may appear remote, there is a weapon forged which can strike with swiftness and effect into the heart of a nation—a weapon, moreover, that can be immediately mobilised from the rapidly increasing supply of commercial aircraft. We are reminded by a correspondent of the medical problems that might arise in future conflicts in the air. "At the outbreak of the last war," he writes, "we had a breathing space, for which the late Lord Haldane was largely responsible, in which to gather our full fighting strength, but in the future, with a rapid declaration of war and perhaps an equally rapid decision, we shall stand or fall by our degree of preparedness at the actual moment of the commencement of hostilities. Though, with the majority of our countrymen, medical men hope and truly believe in better things, we should be false to a trust if we failed to point out certain aspects of the question. While the care of the sick and wounded in our home towns will be largely in the hands of the men on the spot, none can say exactly where a blow may be delivered. The attack may quite as easily fall on some small country town as a large city; the object of bombardment from the air, comprising high explosive, incendiary and gas bombs, may be intentional or unintentional at any particular spot. The actual concentration of gas is immaterial; it may disable by killing or by sickness, but whichever it is it must be dealt with energetically and at once." These things are sadly true. The hospitals are almost without exception situated near the bull's eye—for the target will always be the large city, and they may for this very reason become useless. The victimisation of the small centre will be accidental, and the real problem will be to evacuate the hospital patients as well as other casualties into some gas-free zone, and a clear idea is therefore desirable as to the best procedure.

Ought this to be a matter of immediate attention on the ground that if organisation is not arranged while it is not needed, when it is needed the preparation will be too late? Our correspondent writes further: "We shall discover the necessity for doctors and nurses to understand all the details of anti-gas precautions, but far larger matters are at issue. The siting of temporary hospitals on high ground to windward at the shortest possible distance from the town is a matter which needs thought. Conditions such as the few papers have had a more far-reaching effect than the one in question. Literally hundreds of thousands of eyes have been saved from permanent blindness by von Graefe's work. He died suddenly in 1870 while the Franco-Prussian War was in progress.

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[1] Surg., Gynec., Obst., 1928, xlvi., 332.

[2] Jour. Exper. Med., 1919, xxx., 109.

[3] Brit. Jour. Surg., 1926, xiv., 295.

[4] Amer. Jour. Med. Sci., 1928, clxxvi., 97.

LADY OSLER.

THE death of Grace Osler, widow of the famous Regius Professor at Oxford, has evoked expressions of regret from a remarkably wide circle. The number of guests, medical and literary, to whom Sir William dispensed at Norham-gardens an unending hospitality would be surprising if it were known, and Lady Osler, as his wife, was responsible for their entertainment. The house was nearly always full, for every doctor who visited England from America or Canada, and most of those who came to our shores from the continent, considered it a duty and privilege to "look up Osler and his wife." Grace Revere, Lady Osler, born 74 years ago at Boston, was the great-granddaughter of Paul Revere, the hero of the famous ride. As a young woman she married Dr. S. W. Gross, a professor of the Jefferson Medical College, Philadelphia, and the son of Samuel Gross, the famous American surgeon. She was left a young widow in 1888, and four years later married William Osler, who, having come south from Canada, was earning his famous reputation as a scientist and physician at Baltimore. For 13 years Lady Osler was her husband's helpmate at Baltimore; then, in 1905, came the appointment to the Oxford chair, and from the moment that Osler and his wife arrived in the old University city it was seen how admirably they were fitted for what they made into a joint effort. A well-known Oxford professor writes of her: "She was an instant success and their home became a centre of attraction, drawing all sorts and conditions of men from every quarter of the globe, the most gifted and famous mingling with the youngest undergraduates arriving to present letters of introduction. Her house was also converted into a veritable home for many of the Rhodes scholars, and not a few of these will remember with affection and respect the care she bestowed upon them, her valuable influence and her practical help—things which greatly assisted in promoting the success of Cecil Rhodes's scheme." The outbreak of war found Lady Osler in America, but she returned immediately and threw herself whole-heartedly into all the activities connected with the succour and treatment of the wounded, while, through her influence in America, she was from the beginning able to obtain great sums of money to carry on various schemes. As is well known her only son was killed at St. Julien, but stricken as she was, she only bestirred herself to help with more intimate and perfect sympathy those who could not help themselves. She was an ideal companion to her husband. Tireless in promoting the interest which he had at heart, it was felt, therefore, by everyone that her appointment at Sir William Osler's death as Trustee of the Ewelme Charity was thoroughly fitting; the mastership of Ewelme in connexion with the Chair of Physics had been a mediæval appointment which had made a special appeal to Sir William Osler.

THE DEVELOPMENT OF OBSTETRICS AND GYNÆCOLOGY.

THE three subjects chosen for the discussions at Cardiff, reported on p. 521, indicate how greatly the responsibilities of the gynæcologist have increased since the days when etiquette restricted his operative activities to the perineum. The diagnosis and treatment of sterility, the differentiation of acute conditions in the pelvis by laparotomy if other methods fail, and the actual technique of radium therapy all come within his accepted sphere. An important result of the development of gynæcology has been the clear demonstration that too large a proportion of the commoner diseases of women, notably salpingitis and prolapse, are often traceable to unsuspected infections of venereal disease, or to unscientific midwifery, both of which causes may have long-delayed effects. Venereal disease is now being resolutely attacked, but the practical teaching of obstetrics, as we have recently pointed out, still needs even closer attention than has been given to it by most of the licensing bodies. Dr. George Peachey reminds us in his letter (p. 530) that in the first part of the eighteenth century a licence for the practice of midwifery had to be obtained from the Bishop of London, but that in 1783 the College of Physicians took cognisance of practitioners of that art and instituted for a short term of years only a distinct order of licentiates in midwifery. It is not to be doubted that interest in obstetrics will be stimulated by the reinstitution of a special diploma such as that now granted by the Society of Apothecaries of London. A historical review[1] of the achievements of the nineteenth century in the field of gynæcology and obstetrics, recently published in Vienna, is opportune in view of the efforts now being made to secure for obstetricians and gynæcologists a status appropriate to the range of their specialty. Dr. Fischer's survey, undertaken with the patience and thoroughness that marks the whole of the vast text-book of which it is a part, covers every department of the subject, section by section, and refers to every book and paper worth reading that appeared during last century. The bibliography alone fills no less than 41 pages of small type. Nearly all the vast network of scientific investigation which has culminated in the institution of chairs of gynæcology and obstetrics of every university, with laboratories in which anatomy and physiology of the normal and pathological reproductive organs are constantly being studied, has grown up since 1800. The results of the works of Lister, Koch, and Semmelweis, and the discovery of the nature of micro-organisms, have in no other department of medicine been of more vital import for prophylaxis, diagnosis, and therapy. The discovery of the application of general and local anæsthesia in conjunction with aseptic technique, and the later discoveries in serology and radiology, have been as useful to the gynæcologist as to the general surgeon.

Dr. Fischer's synopsis is not light reading, but the reader intent on tracing the evolution of any aspect of midwifery or gynæcology through the age most critical for its growth, will find it an admirable guide. He will notice the gap between 1899, when the survey ends and the present day, the more for the guidance he has had through the preceding century. This century has been of even more interest than the last and has witnessed a progress twice as rapid as that which Dr. Fischer chronicles. It is to be hoped that this volume may be supplemented by an account of the development of obstetrics and gynæcology in the first quarter of this century.

EDUCATION AGAINST TUBERCULOSIS

THE National Association for the Prevention of Tuberculosis has been successful in its appeal for £100,000, and thanks to the funds thus provided extensive propaganda throughout the country is now being undertaken. The report of the Association for the year 1927 which has just been issued gives some details of the educational work which is in progress under the guidance of the medical commissioner, Dr. William Brand, and three assistant medical commissioners who were appointed last year. They have all been actively engaged in different parts of the country, where they have aroused interest and percentage of cases when a heterologous strain of spirochæte is employed than with a homologous strain. The refractory state towards a second infection in rabbits, which develops in time, is more marked towards the homologous strain than a heterologous strain. Second infection in cases of neuro-syphilis would, if frequent, add support to the existence of dermotropic and neurotropic strains of spirochæte; but Halley and Wasserman were unable to find any tenable reports of such reinfection. The increasing number of reported cases of second infection in man, and their preponderance among those who received treatment with organic arsenical compounds in the early stage of the disease, support the claim made for these remedies of producing complete sterilisation in early syphilis.

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[1] Biologie und Pathologie des Weibes. By Priv. Doz. Dr. J. Fischer. Lieferung 44. Edited by Hofrat Prof. Dr. Josef Halban, of Vienna, and Geh. Hofrat Prof. Dr. Ludwig Seitz, of Frankfurt a.M. Berlin and Vienna: Urban and Schwarzenberg. 1928. Pp. 284. M.15.

BLOOD FORMATION.

USING the bones of fœtal and young guinea-pigs and rabbits, Prof. Witherington Stump, of the Department of Anatomy of the University of Sydney, has recently reinvestigated the problem of blood formation, so far as it takes place in the red marrow. Prof. Stump found this type of material particularly well suited for investigation, and expresses surprise that previous workers have so seldom used it. The results, which appear in a recent number of the *Medical Journal of Australia* (1927, ii., 702), contribute few new facts but constitute a valuable commentary on the present state of our knowledge of blood formation. Prof. Stump finds himself most closely in agreement with the views of Dantschakoff and Maximow on the genesis of the various cells produced in the red marrow; he is a convinced and thoroughgoing monophytist, believing that all the peculiar cells of the red marrow, even to the megakaryocytes, are produced from a common stem cell. This cell he believes to develop by direct maturation of certain of the indifferent mesenchyme cells; the remaining mesenchyme cells finally produce the reticular system in which the differentiated stem cells then come to lie. These stem cells occurred abundantly in the tissues used by the author; they are described as possessing a large deeply staining nucleus, with abundant chromatin and a strongly basophile cytoplasm. From this cell the author was able to trace the development of red cells, granulocytes of all three orders, and megakaryocytes—the monocytes apparently did not come within the purview of the study. The article contains some valuable hints as to technique for those wishing to follow a similar line of investigation, for Prof. Stump is one of those rare individuals possessing a simplifying mind. He keeps his descriptive terms within strict limits, and has a hard word for the "unwieldly terminology (of hæmatology) which has passed beyond the limits of scientific application." It is, however, possible to be too simple, and it is to be hoped that Prof. Stump will in due course publish more detailed descriptions of his researches.

SINGULTUS EPIDEMICUS.

THE occurrence of epidemics of hiccough associated with influenza has been reported now and then; an interesting account of six cases during the epidemic of 1926–27 in Czechoslovakia is given by Dr. B. Kuklová,[1] the first woman to hold a chair of medicine in that country. The accompanying influenza epidemic lasted from Nov. 1926 to March 1927, affecting mainly persons between 20 and 30 years of age. Hiccough occurred in four women and two men, all between 18 and 28 years of age, with the exception of an old man of 65. The onset varied: in three cases the hiccough was the first and only sympton, in two cases it set in with a raised temperature and catarrhal symptoms, and in one it was associated with an exacerbation of an already existing digestive disorder. The hiccough in every case was extremely resistant to treatment. Sleep was always disturbed and the sugar in the cerebro-spinal fluid was increased. There were present also myoclonic contractions which affected both halves of the diaphragm, the muscles of the upper part of the chest, the throat, the external eye muscles, and eventually those of the extremities. In two cases the respiratory rhythm was disturbed after the hiccough had passed off, or between the attacks, and in one case compression of the eyeballs produced apnœa. The first attack of hiccough lasted from one hour to 14 days, most frequently being three to four days in duration. In four of the patients subsequent attacks developed some weeks later. The shortest duration of the illness was seven days and the longest 110 days. In four of the patients there was a well-marked hysterical element. In the chronic cases galvanism of the phrenic nerve was employed with success in treatment. Attempts to transmit the disease to rabbits and guinea-pigs failed, although the presence of an infective agent in the nasal and nasopharygeal mucus of the other influenza patients had been proved by experiment. These cases of hiccough raise interesting points for study; there is a close parallelism between many of the associated nervous symptoms and those occurring in or following epidemic encephalitis.

ALBRECHT VON GRAEFE.

FEW in surgery, and none in ophthalmic surgery, have better deserved than Albrecht von Graefe the familiar apostrophe "E tenebris tantis tam clarum extollere lumen qui potuisti." In his short life of 42 years he revolutionised much of ophthalmology. His glaucoma operation has stood the test of time, while his cataract knife is used daily throughout the world. In this country his name is always coupled reverently with those of Bowman, George Critchett, and Donders. The four were great friends; Bowman and Critchett were mainly responsible for placing the science of ophthalmology on a sure basis in this country and von Graefe did a like service for it in Germany. This is von Graefe's centenary year. He was born in Berlin a hundred years ago; he was the youngest son of Charles von Graefe, a well-known surgeon of his day in Germany. His father died while he was yet in childhood, and he was largely dependent for his upbringing on his mother's care. After the usual course of study at Berlin he spent some time in the chief foreign clinics, notably under Arlt at Prague and in Vienna. To Arlt is said to belong the credit for having first turned von Graefe's attention to ophthalmology. He also visited the British Isles and spent some time in London, Edinburgh, and Dublin. Ample private means sometimes have a soporific effect upon a young professional man, but they had no paralysing effect upon von Graefe, who built a hospital of his own and rapidly acquired a tremendous reputation not only in Germany but throughout Europe. He was lucky in starting on his ophthalmological career at a propitious time; in 1851 von Helmholtz gave to the world his epoch-making discovery of the ophthalmoscope. Von Graefe was quick to see the enormous advantages that would accrue to those who made themselves familiar with the new instrument. He is credited with having announced in an address that "Helmholtz has opened a new world." This appreciation of the ophthalmoscope on the part of von Graefe is in marked contradistinction to that accorded by Wharton Jones, a few years earlier, when shown a similar model of an ophthalmoscope by Charles Babbage. Not content with an enormous practice, von Graefe founded, in 1854, the *Archiv für Ophthalmologie* and ran it single-handed for the first year. In 1855 he was joined by Arlt and Donders in the editorship. From that date until his death hardly a number of this journal appeared without containing a communication by von Graefe, and in 1857 he gave his famous work on iridectomy in "Glaucoma, and on the glaucomatous process" to the world in its columns. It can safely be said that few papers have had a more far-reaching effect than the one in question. Literally hundreds of thousands of eyes have been saved from permanent blindness by von Graefe's work. He died suddenly in 1870 while the Franco-Prussian War was in progress.

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[1] Bratislavské Lekarske listy, r.VII., s.3. Summary in French, English, and German.

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The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

II.—REPORTS ON SWABS FROM THE THROAT AND NASAL PASSAGES.

By J. E. McCartney, M.D., Ch.B., D.Sc.,
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(1) Cases Suspected of Diphtheria.

It is the habit of many practitioners, when there is any acute inflammatory condition of the throat, to take a swab of the throat and send it to the laboratory for a report. Often there is no information furnished regarding the patient, and when such information is sent it is often meagre and of little or no assistance. The clinician frequently waits for the laboratory report before instituting treatment, and his whole conduct of the case is usually guided by the pathologist's findings in the material sent. Many practitioners regard the laboratory report as infallible, and in so doing are content to assume that the responsibility of diagnosing the case must rest with the pathologist. This attitude is misleading and dangerous. The pathologist can assist the clinician by giving certain information, which must be considered in relation to the condition of the patient. The practitioner himself must assess the value and significance of the pathologist's report with regard to each individual patient. Half a dozen identical reports may be issued from a laboratory, but the interpretation of them may be absolutely different in each case. It is the object of this article to try and indicate what significance should be attached to various laboratory findings in respect of these swabs according to the clinical condition of the patient.

Klebs-Löffler Bacillus (K.L.B.).

The great majority of throat swabs are sent to the laboratory in order to ascertain whether the diphtheria bacillus is present or not, and great care should be exercised by the practitioner in taking the swab that material is obtained direct from the lesion.

Laboratory Technique.—The technique usually employed is to inoculate a tube of Löffler's serum, which is then incubated at 37° C. for 18 to 24 hours. In addition, two direct films are made from the swab, and one is stained and examined for the diphtheria bacillus, while the other is stained with dilute carbol-fuchsin or methyl-violet to determine if the organisms of Vincent's angina are present. In a proportion of cases positive results may be obtained immediately by an examination of direct films, but cultures must also be made as a routine.

After incubation, films are made from the culture and stained with the particular diphtheria stain in use in the laboratory, which may be Löffler's methylene blue; Neisser's stain (either the original method or a modification); Pugh's acetic acid—toluidine blue; or Albert's method, which is a modification of Pugh's stain. The particular stain used depends entirely on the choice of the individual bacteriologist, and should have no influence on the accuracy of the report.

The stained films are examined microscopically, and the characteristic beaded appearance of the diphtheria bacillus makes its recognition easy in definitely positive cases. A number of bacilli of the "diphtheroid" group resemble the diphtheria bacillus more or less closely, but a competent bacteriologist can usually discriminate between them with confidence.

The Significance of Positive Reports.

The report as to the presence of diphtheria bacilli is made from the microscopic examination of the culture. When the swab is taken from a case of acute inflammation of the throat or nasopharynx, and the clinical disease is suggestive of diphtheria, the presence of diphtheria bacilli in the cultures—i.e., positive report—is sufficient evidence that the disease is diphtheria, and that the bacilli are virulent. In carriers, however, or in persons not showing clinical symptoms of diphtheria, fermentation and virulence tests must be carried out to establish the full identity of the organism.

The report may be variously drafted:—

(1) "Diphtheria bacilli present."
(2) "Diphtheria bacilli positive."
(3) "Diphtheria bacilli +" (or ++, or +++).
(4) "Diphtheria bacilli positive (scanty)."
(5) "Bacilli morphologically indistinguishable from diphtheria bacilli are present. A virulence test is being done, and the report will be forwarded in 5–8 days' time."

In any report the terms "K.L.B." and "diphtheria bacilli" are synonymous. The reports (1), (2), and (3) explain themselves.

(4) This report indicates that only a very few diphtheria bacilli can be recognised even after culture, and must be interpreted solely in the light of the clinical condition. If the case is one of acute inflammation of the throat, but clinically *not* diphtheria, a report such as this would be almost equivalent to a negative finding. The case should be watched and a further swab sent immediately. On the other hand, if the swab is from a convalescent, it indicates that the diphtheria bacilli have almost disappeared and that the case may soon be considered fit for discharge.

(5) Where no indication is given to the bacteriologist as to the clinical condition and site of the disease; where the material is from some other part of the body, such as the ear, eye, or in a wound; or where the case is that of a suspected carrier or even a chronic carrier, the mere presence of diphtheria-like

organisms does not mean that these bacilli are virulent—i.e., capable of causing the disease—or even true non-virulent diphtheria bacilli, since certain diphtheroids may simulate microscopically the Klebs-Löffler bacillus. Under the conditions above mentioned it is impossible to determine virulence purely from microscopical examination, and a virulence test is absolutely necessary. As indicated in the report quoted above, a virulence test is frequently done without further notice by the laboratory, and the conduct of the case will be determined by the result of this test. On the other hand, it must be remembered that some bacteriologists, realising that the diagnosis of the presence of virulent diphtheria bacilli cannot be made solely from microscopical examination, issue the positive report always in the cautious manner of "bacilli morphologically indistinguishable from diphtheria bacilli are present." If a virulence test is not suggested by the bacteriologist, this form of report may be regarded as positive.

To sum up, any acute condition of the throat in which a positive report is received must be regarded as diphtheria and treated as such until evidence is obtained to the contrary. In doubtful cases it is advisable to have the organisms isolated if possible and a virulence test performed.

The Significance of Negative Reports.

A negative result means that no diphtheria bacilli can be recognised microscopically in the culture. When the swab has been taken from a person who has not active or clinical diphtheria, such as a carrier, it is important that the culture tube showing a negative result should be incubated for a further 24 hours. It would appear that in many of these cases the bacilli are in a state of "lag," and do not commence to grow as quickly as organisms from acute cases. The percentage of positive results from carriers may be as much as 50 per cent. higher when the cultures are re-examined after a further 24 hours' incubation.

If the case is one of acute inflammation, and from the clinical appearance the presumption is that it is *not* one of diphtheria, then a negative report is of value and will confirm this opinion. If, on the other hand, the symptoms are those of diphtheria, then the diagnosis of diphtheria must still be maintained, and specific treatment continued in spite of a negative report. A further swab should be submitted to the laboratory.

If a convalescent diphtheria case is ready for discharge, one negative report does not mean that the patient is free from infection. Three consecutive negative reports are required, and the swabs should be taken carefully, and not immediately after meals or after local treatment such as antiseptic gargles. With carriers even three negative reports are not sufficient to declare the case as free from infection. If virulent diphtheria bacilli have been present six consecutive negative reports at twice-weekly intervals will be necessary.

If the case, when first seen by the practitioner, is recovering from an illness thought to be diphtheria, a negative swab report must be considered in conjunction with a Schick test. Broadly speaking, a positive Schick test and a negative swab indicates that the case is not diphtheria, while a negative Schick test and a negative swab in a young person suggests that the disease is likely to be diphtheria.

It must be remembered that in diphtheria a throat swab alone is not sufficient, particularly in convalescents and suspected carriers, and a *nasal swab should always be taken as well*, while in certain cases a swab from the ear should also be secured. The report on the nasal swab should be considered in the same manner as that on the throat swab.

Remarks.

In considering laboratory reports the clinical aspect of the case must be taken into consideration. The responsibility rests with the clinician, who must not rely implicitly on the bacteriological diagnosis; in any case where there is a reasonable suspicion of diphtheria it is his duty to administer antitoxin at once, and to continue to do so even in spite of a negative laboratory report. *The practice of withholding antitoxin until the report on the swab has been obtained cannot be too strongly condemned.*

The mortality of diphtheria increases with the delay in administering antitoxin, and the wait of 18 to 24 hours which must elapse before the bacteriological report can be given may in some cases determine the fatal issue. If antitoxin has been given, and the case turns out not to be diphtheria, no harm has been done, but if the patient is really suffering from the disease the prompt administration of antitoxin increases tremendously the chance of recovery. As an aid to the clinical diagnosis the laboratory report is invaluable, but it must never be considered a substitute.

The foregoing remarks apply particularly to the first few days of the acute stage of the disease. It must be remembered that diphtheria bacilli rapidly disappear from the throat during convalescence. At the end of the fourth week only one-third of the patients harbour bacilli, while only one-fifth show a positive swab by the end of the sixth week. These facts must be borne in mind when assessing the significance of a laboratory report. A report showing "scanty diphtheria bacilli" will have a different significance depending on whether the case is an acute tonsillar inflammatory condition not clinically diphtheria, or a convalescent patient almost ready for discharge.

Carriers.

Although in 80 per cent. of cases the diphtheria bacilli have disappeared by the sixth week, in some instances they may still persist for a long time, and if they are present after 12 weeks from the onset of the disease (8·73 per cent. of cases), the patient is arbitrarily termed a "carrier." It is essential tha the virulence of diphtheria-like organisms in such cases should be tested, since only virulent organisms are capable of spreading the disease; if the bacilli are non-virulent the patient can be released from quarantine. When diphtheria-like organisms are found in the throats of those not suffering from the clinical disease, as in healthy contact cases, or suspected carriers, the morphological appearance alone is not diagnostic.

Virulence Test.

The diphtheria bacillus must first be isolated in pure culture by plating on special media, and fermentation tests are then carried out. Production of acid should occur in glucose but not in saccharose. A guinea-pig is then inoculated intracutaneously with a small amount of the culture. Usually a week must elapse before a report on the virulence test can be received. As far as is known, non-virulent diphtheria bacilli are not capable of giving rise to the clinical symptoms of diphtheria.

Other Organisms in Association with Diphtheria.—Some reports mention the other organisms that are found in the cultures, in addition to diphtheria bacilli, and reference is made sometimes to the presence of hæmolytic streptococci. In most cases of diphtheria hæmolytic streptococci are present, often in large numbers, and as long as there is nothing out of the ordinary in the clinical aspects of the case the mere presence of these organisms has no special significance. On the other hand, it must be recognised that severe adenitis may be caused by streptococci, and that they accentuate the severity of the throat lesions.

The presence of Hofmann's bacillus has no pathological significance. It is often found in large numbers in the throats of convalescent diphtheria patients, particularly when the Klebs-Löffler bacilli have disappeared. It is non-virulent to laboratory animals.

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ANNUAL MEETING AT CARDIFF.

(*Continued from p. 469.*)

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PREVENTION AND TREATMENT OF DIPHTHERIA.

Dr. J. D. ROLLESTON (M.A.B.) considered prevention under two headings: (1) general measures, including isolation, disinfection, and treatment of the carrier; and (2) specific immunisation. Although it was doubtful whether isolation of diphtheria patients in special hospitals had had much effect in reducing its incidence, it was generally agreed that diphtheria required such treatment more than any other disease admitted to fever hospitals. There was a growing tendency among medical officers of health, medical superintendents of fever hospitals, and other sanitary authorities to discredit the value of terminal disinfection after diphtheria, and to regard the living carrier as responsible for the spread of the disease. The period of isolation of a patient should be determined by clinical considerations. In the absence of any discharges from the nose or ear or acute inflammatory condition of the throat, a patient who had had a mild attack might be set at liberty at the end of a month. In cases of any degree of severity the patient should be detained at least six weeks, as during that time some form of paralysis was most likely to develop. No uniformly successful method had yet been discovered for dealing with the carrier. The most efficacious measures were tonsillectomy and treatment of sinus infections, but they were not always practicable nor invariably successful. The practice of insisting on one or two negative faucial and nasal cultures before discharging a patient was merely illusory, as owing to the frequent occurrence of intermittency in the carrier state a false sense of security might arise from obtaining such cultures. As the return case rate was no higher in those hospitals which had abandoned the practice of swabbing patients before discharge than in those in which it was still observed, Dr. Rolleston had discontinued the practice at his own hospital since his appointment as medical superintendent two and a half years ago, without finding that this discontinuance had been followed by an increase in the return case rate. Specific immunisation against diphtheria was either passive, by injection of small doses of antitoxin, or active, by injection of toxin-antitoxin or similar preparations. The immunity conferred by passive immunisation, though immediate, was only of short duration, and the injection of antitoxin also predisposed the individual to an unusually severe reaction when a therapeutic dose was needed in the course of the next few years. Dr. Rolleston said that in hospitals and in families where the children could be kept under close observation after exposure to infection he did not think it necessary to carry out passive immunisation, though he was aware that in some clinics, especially on the continent, it was the practice to administer prophylactic doses of antitoxin with or without a preliminary Schick test, on the occurrence of a single case of diphtheria in a children's ward.

In carrying out active immunisation, which conferred a more durable and possibly permanent immunity, it had recently become the practice, especially in public health work in dealing with children under 6 years of age, to dispense with the preliminary Schick test, as the great majority of them were susceptible to diphtheria. In adults, on the other hand, who were more likely to react severely, a preliminary Schick test was necessary. In a large number of fever hospitals it was now the rule to carry out active immunisation of the nursing staff on joining. Since the introduction of active immunisation of newcomers the incidence of diphtheria among the nurses at the Western Hospital (Metropolitan Asylums Board), though it had never been very high, had shown a slight fall. Attacks of diphtheria occasionally did occur in nurses whose Schick reactions were negative either spontaneously or as the result of immunisation. This was probably due to nurses being exposed to massive doses of virulent infection, whereas other negative Schick persons who were exposed to only slight and occasional infections escaped. In addition to protecting nurses, active immunisation was indicated in schools, creches, orphanages, and other collections of children. Although no fatal accidents following active immunisation had occurred in this country, as they had in the United States, Austria, China, and Russia, the local reaction and constitutional disturbance were often severe. Owing, therefore, to the occasional failure to protect, and the possibility of severe reactions, Dr. Rolleston had been unwilling to make active immunisation against diphtheria compulsory, like vaccination against small-pox, especially as diphtheria antitoxin was an infallible remedy within the first 24 hours, whereas in small-pox no treatment, however early it was employed, invariably modified the course of the disease.

Dr. Rolleston discussed the treatment of diphtheria, in order of importance, under the headings of serum therapy, general measures, and local treatment. Like most of his colleagues in the Metropolitan Asylums Board hospitals he was, he said, in favour of comparatively large doses of antitoxin—viz., 4000–8000 units for mild faucial or nasal cases, 12,000–16,000 units for moderate attacks, and 24,000 units, repeated, if necessary, for severe attacks. He preferred intramuscular injection into the vastus externus to any other method, as it ensured a much more rapid absorption of antitoxin than the subcutaneous method, and was much safer and pleasanter for the patient than intravenous injection, which was followed in a large proportion of cases by rigors or shock. While fully convinced of the importance of early administration of antitoxin, having never seen a death from diphtheria nor severe paralysis when antitoxin had been given on the first day of the disease, he could not too strongly denounce the doctrine that antitoxin was of no value after the fifth day of disease. As he had maintained many years previously,[1] clinical rather than chronological considerations should be the guide in the treatment of diphtheria, the presence of membrane in the throat, nose, or elsewhere being an indication for sero-therapy. The chief advance in recent times in the treatment of diphtheria had been the use of a refined or concentrated serum, whereby the incidence of rashes and other unpleasant sequelæ had been reduced to a minimum. The only manifestation of serum sickness now seen was urticaria, the frequency of which, however, had been reduced from 60 to 30 per cent. of the cases injected. The most important principle in the general treatment of diphtheria was the enforcement of rest for a period proportionate to the severity of the initial angina. It was doubtful if any drug had power to modify favourably the course of the disease, though adrenalin appeared to be of value in forestalling or combating the suprarenal insufficiency which played an important part in the syndrome known as cardiac paralysis. Alcohol, which for long had been regarded as indispensable in diphtheria, so far from being of any value in the disease, was liable to increase the myocardial degeneration initiated by the diphtherial poison. In 1927, when no alcohol at all was used in the treatment of diphtheria at the Western Hospital, the case mortality (3·01 per cent.) was lower than in any of the other M.A.B. hospitals.[2] Since the introduction of antitoxin local applications to the throat had occupied a very secondary position in treatment. In a series of 3000 cases Dr. Rolleston had employed local treatment in only 364 (12·13 per cent.). Most of these patients were older children or adults, who welcomed any form of local treatment which younger children as a rule resisted. From comparative observations it had been found that the average period for the throat to become clean after injection of antitoxin was practically the same whether local treatment had been employed or not.

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[1] THE LANCET, 1907, i., 1112.

[2] See THE LANCET, 1928, i., 820.

Discussion.

Dr. GRAHAM FORBES (London) gave a summary of diphtheria preventive work in Great Britain up to June, 1928: (*a*) of 44,131 persons tested in council schools and welfare centres, 72 per cent. had proved positive and 40,512 had been immunised; (*b*) of 36,329 persons tested in residential schools, 13,625 had proved positive and 9155 had been immunised; (*c*) of 10,511 members of hospital staffs, 3598 (34 per cent.) had been found positive and 4184 had been immunised. In this total of 91,036 persons of all ages, of whom 53,841 had been immunised, no known serious harmful effect—still less a fatality—had resulted, though a total of at least 300,000 injections had been given.

Dr. E. W. GOODALL (late M.A.B.) marvelled that after so many years there should still be a divergence of opinion on such important questions as the method of administration and the dosage of antitoxin. There could be no question that the serum was brought into immediate contact with the toxin in the blood by intravenous injection, yet when the remedy was first introduced most remarkable results were obtained by the subcutaneous method. The dosage of the early days would be considered insignificant by most modern clinicians. As the result of trial of intravenous injections, and large doses up to 200,000 units, he had come to the conclusion, after a very large experience, that intravenous injection should be reserved for the more severe cases, intramuscular for the moderately severe, and subcutaneous for the benign. He considered that about 30,000 units was the limit of dosage beyond which it was unnecessary to go. As regards serum treatment, every case should be treated on its clinical merits, irrespective of the duration of the illness. It was folly to wait for the result of a bacteriological examination before administering serum. Prolonged rest in the recumbent position was essential if the patient was to be secured from the risk of heart failure during convalescence. He had long been of the opinion that cardiac stimulants were useless in the acute stage.

Dr. JOHN MCGARRITY (Cardiff) said that with the late Dr. Claude Ker he had carried out the Schick test in over 3000 individuals of all ages, including patients, nurses, and medical students during the latter part of 1922, and during 1923 and 1924 in the City Hospital of Edinburgh. At Dr. Ker's suggestion he had immunised with toxin-antitoxin over 300 Schick-positive children in that institution, practically all under 10 years of age. This group showed so little local or constitutional reaction that Dr. Ker advised the public health authorities of Edinburgh that similar measures could safely be employed among the school-children of that city. The work had been begun in 1923, and over 6000 children had now been immunised without any ill-effects. In those days toxin-antitoxin was used, and while few, if any, of the children under 10 years of age were upset in the least by the inoculations, many of the nursing staff, 132 of whom were immunised, suffered severely, both locally and constitutionally, especially those who showed pseudo-reactions when Schick tested. Since the use of toxoid-antitoxin had become general, it was unusual to encounter any reactions at all, even among adults. During the last three years none of the nurses in the Cardiff Isolation Hospital had complained of anything worse than a sore arm and slight headache. In the Cardiff schools some hundreds of children had been tested and immunised since the work began in 1926 without any ill-effects. In Cardiff no child who had given a negative Schick reaction when tested in the schools had up to date developed diphtheria; nor during the last three years had any of the nurses or maids at the Isolation Hospital with a negative reaction contracted the disease. The treatment of diphtheria depended very largely on the early clinical diagnosis and the early administration of a suitable dose of diphtheria antitoxin, although the after-care was very important. Dr. McGarrity's practice was to give an intramuscular injection in doses of from 3000–4000 units for mild cases, 6000–8000 units for moderate cases, and from 10,000–20,000 units for severe cases. He seldom found it necessary to give more than 60,000 units of antitoxin to the most severe cases, but he invariably gave the first dose in severe cases intravenously and the rest intramuscularly. He had found caffeine-sodio-salicylate or camphor the best drugs to use in threatening heart failure, given hypodermically in from gr. ½ to grs. 1 or 2, every two or four hours. He was also in favour of alcohol in small doses. In the treatment of laryngeal diphtheria he preferred intubation to tracheotomy, but did not recommend it for use in general practice. He recommended spoon-feeding rather than feeding by nasal tube in either case.

Dr. CYRIL LEWIS (Cardiff) presided when Prof. T. GILLMAN MOORHEAD (Dublin) opened a discussion on

ACUTE NEPHRITIS.

A study of the reports of the Irish Free State for the last five years showed, he said, that one death in every 231 registered to be due to acute nephritis. In England and Wales over the same period, one death in every 334 was found to be caused by acute nephritis. Owing to the comparative infrequency of the disease, the study of groups of cases was not possible until the Great War period. Prof. Moorhead desired to emphasise at the outset three points in prophylaxis—the common-sense removal of all septic foci, with especial attention to the throat and nasal sinuses; Osman's alkali treatment, which he received with hope but with caution, for Peters had found no significant difference in the onset of [illegible] those treated with and without [illegible] in a series of 8000 cases analysed for the period 1910–22. The third point—the value of scarlatinal antitoxin was still sub judice—but reports up to date were "fairly satisfactory."

The repeated attempts at classification had resulted in a lack of recognising the unity which underlies the varying pathological manifestations of the acute condition. The term nephrosis was not necessary, as he regarded it merely as a variety of acute nephritis identical with the condition called toxæmic kidney by English writers. Rather than have a classification it was wiser to have in mind "the kidney composed of four elements—glomerular, tubular, interstitial, and vascular—and that each element may be involved in a varying degree according to the cause of the inflammation, its severity and its duration, and provided we remember that the functional changes are likely to vary also with the degree of involvement of each of these structures and the severity of that involvement, we will do better as clinicians to recognise one form of acute nephritis only." That staphylococcal toxins are more likely to produce parenchymatous lesions and resultant œdema, and streptococcal toxins glomerular lesions, is not a view that has been convincingly proved, and hæmorrhagic and œdematous cases are by no means invariably clear cut. The value of blood-pressure estimations was stressed, for a rise occurs in all primary acute attacks, and a fall accompanied by a diminution in size of the heart are favourable signs. The only cases that are open to any doubt in diagnosis are cases of anuria with palpable swelling of one or both kidneys and delayed appearance of œdema.

The character of the protein in the urine desires further and closer study; attention was drawn to the work of Kellaway, Davies, and Williams, who suggest that much of the protein present consists of kidney substance in cases of severely damaged kidneys. The estimation of the quantity of protein passed per diem is of value in acute nephritis, but the Esbach's albumino-

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[1] THE LANCET, 1907, i., 1112.

[2] See THE LANCET, 1928, i., 820.

Dr. R. L. **Mackenzie Wallis** (London) dwelt on the means of distinguishing a toxic and an inflammatory condition of the kidneys. He has found that in toxic kidneys the main diagnostic features are a low blood-urea, a raised diastase content of the urine, and the presence of a relative excess of globulin in the urine. Dr. Wallis finds that the administration of HCl orally is very helpful in reducing the blood-urea in cases of acute nephritis.

Dr. A. F. S. **Sladden** (Swansea) wished to stress that all laboratory tests in all pathological states were only auxiliary and secondary to clinical observation. He had found the estimation of ammonia in the urine to be valuable in estimating the progress—as it was diminished in acute nephritis, and when conditions improved the excretion of NH_3 increased.

Dr. J. **Wilkie Scott** (Nottingham) remarked that rise of blood pressure seemed now to be generally regarded as an important factor in the attacks of convulsions and unconsciousness. He had found great benefit from venesection both in uræmic attacks and in eclampsia when the pressure was high. In acute suppression of urine of more than 36 hours' duration the advisability of capsulotomy should be considered.

SECTION OF SURGERY.

Pancreatitis.

Mr. J. W. **Geary Grant** (Cardiff) opened the discussion. The term "pancreatitis" had been deliberately chosen in order to include the many varieties of this rather rare disease. His own remarks were based on personal experience of six cases seen in the last two years. He proposed to limit himself to acute necrosis of the pancreas. This term was preferred because it did not beg the question of a primary inflammatory origin and did not postulate hæmorrhage as a necessary part of the picture. The pancreas possessed two ducts which varied in their relative size and might, or might not, anastomose. The main duct of Wirsung joined the bile-duct about 4 mm. from the duodenal opening, the distance varying from zero to 11 mm. The text-books described four types, shown by Brocq to be four stages, of acute pancreatitis: œdematous, hæmorrhagic, gangrenous, and suppurative. Some of the suppurative cases were probably examples of primary infection, others were secondary infections following on necrosis of the gland. In studying papers and case reports on acute pancreatitis striking differences were found in types of disease and mortality in different clinics and also wide divergence of views on ætiology and treatment. Pancreatic necrosis depended on the setting free of the secretion and its activation in the ducts of the gland. For this it was necessary that the pancreas should be in the phase of secretion and that the proferments should be activated by some agent. The importance of the first condition was shown by Brocq's experiments, in which bile, injected up the duct of Wirsung, failed to produce pancreatitis unless the dog had previously had a full meal. Clinically sudden onset of the disease often followed a heavy meal. Activation of the proferments could be brought about by normal bile or, better, bile deprived of its mucus or concentrated, by succus entericus if it gained access to the gland through a patent duct of Santorini, and probably by products of cytolysis of gland cells and leucocytes, calcium salts, and bacteria. It was therefore probable that acute necrosis could occur in more than one way. At present three main theories were held concerning it: 1. Vascular, due to embolism or thrombosis of pancreatic vessels. Experimental evidence gave no support to this view. 2. Infective. This theory, strongly supported by Deaver and Maugeret, and lately by Graham and others, held that infection spread by way of the lymphatics from the gall-bladder to the head of the pancreas. Against this theory it might be said that in the vast majority of instances the hæmorrhagic fluid in the general abdominal cavity and in the lesser sac was sterile. Experimental infection of liver and gall-bladder with staphylococci did not produce pancreatic necrosis. Infections of the gall-bladder were common; if they were the cause acute necrosis should be more frequent than it was. Gastric and duodenal ulcers were not followed by pancreatitis, although infection might be conveyed to the pancreas in these conditions. 3. Theory that necrosis caused by regurgitation of bile up the pancreatic ducts. Brocq and Binet found that when the duct of Wirsung in the dog was divided and left open in the peritoneal cavity, fat necrosis did not ensue, but if the secretion was allowed to mix with bile hæmorrhage and steato-necrosis followed. The activating agent in the bile was the glycocholate of soda. The probable mechanism by which bile regurgitated into the pancreatic duct was the impaction of a small calculus in the bile papilla and several such cases had been reported. For the bile to reach the pancreas the stone must block the papilla without blocking the duct of Wirsung. This could only occur in a certain number of people where the length of the ampulla was at least twice the diameter of its opening into the duodenum, but as acute pancreatitis was comparatively a rare disease the theory would not be invalidated on that account. Spasm of the sphincter of Oddie might cause regurgitation of bile if it embraced the common duct distal to the junction of the duct of Wirsung. Another way in which secretion in pancreatic ducts could be activated was by the forcing of duodenal contents with succus entericus into the valveless duct of Santorini during violent vomiting. A rare cause of pancreatitis was the entry of an ascaris into the duct of Wirsung. A few cases had followed various abdominal operations and were due to injury to the pancreas or ducts.

Diagnosis might be very difficult especially in the "formes frustes" of the disease. The speaker felt that the teaching that acute conditions of the gall-bladder should be allowed to settle down before operation was entirely wrong, for pancreatic disease was often present. If there was any suspicion of the pancreas being involved it should be inspected at operation. With regard to treatment abdominal drainage in the region of the pancreas, incision of the gland, gauze tamponage and drainage, or either treatment with drainage of the biliary tract had all given good results. Under no conditions should the gall-bladder be removed. The administration of aspirin and hexamine might do good.

Mr. **Digby Chamberlain** (Leeds) confined his remarks to acute pancreatitis. At Leeds they had had experience of 21 cases in the last ten years. The condition was probably not as uncommon as was thought for many cases settled down without operation. They all knew of cases of gall-bladder disease which had settled down, and later when they were operated on a swollen pancreas was found with fat necrosis. He was unable to differentiate between the cases which should be operated on and those which should not. In all of his cases except one he had found an infected gall-bladder with stones. Bile taken at operation in four cases had contained a hæmolytic streptococcus. The cyanosis, which was so often present, was not the result of septicæmia as had been suggested because no methæmoglobin was found in the blood. It was due to impaired action of the diaphragm and was found in other conditions besides pancreatitis. The diastatic index in the urine was important in diagnosis. For treatment he advised immediate operation with drainage of the gall-bladder as well as of the pancreas. The ideal was to drain posteriorly, resecting the eleventh rib in the mid-axillary line, but generally the patient could not stand the extra ten minutes involved in this procedure. He protected the abdominal wall from the action of gastric juice by painting with rubber meter is quite unreliable—the readings of which vary widely with the temperature. Dr. Moorhead thought that the progress of the case and the immediate prognosis may be better determined by blood-urea estimation than by any other laboratory examination. Discussing the question of chlorides and their absence from the urine, he regarded it the result of a locking-up of chlorides in the body due to tissue demand rather than to renal failure. A slight acidosis, due to diminution of the sod. carbonate content of the blood, is also present—an observation which had been foreshadowed long ago by clinicians who knew that it was more difficult to make the urine alkaline in acute nephritis than in health.

An increase of phosphates in the blood is associated with the development of toxic symptoms, and the return of the phosphates to a normal level is of favourable significance. This is the basis of von Noorden's special recommendation, that large quantities of calcium be given to all cases of nephritis taking milk as their stable diet, for the phosphoric acid content of milk is high.

Changes also occur in the cerebro-spinal fluid in acute nephritis—it is under increased pressure—an increase of urea and an increased protein content. Writers have also remarked on the high chloride content of the cerebro-spinal fluid in nephritis, and that a high chloride value is invariably found in uræmia. Regarding *prognosis*, by far the largest number of cases pursue a favourable course. In the experience of Dr. Moorhead, those cases which present the greatest increase of blood pressure recover most rapidly. He refers to the observation of de Wesselow, that 70 per cent. of the war nephritis have recovered completely, and also the work of Hume and Nattrass, who showed a recovery in 77 per cent. in war cases, but only 45 per cent. recovery in acute cases in the period 1922–25. In judging these cases following an acute attack, functional tests are most valuable, but he cannot agree with some writers who have stated that provided these tests are normal, a persistent albuminuria can be discarded, for, in his opinion and experience, they remain poor in health and are liable to intercurrent infections.

Speaking on treatment, Dr. Moorhead thought that the rigid rests in bed treatment had been overdone; provided there is no hæmaturia, cases with albumin in the urine and œdema often improved when they are allowed to get up. For the few days of the acute condition, when there is frequently anorexia, small quantities of milk and water, to which a little calcium carbonate has been added, satisfies. Later, carbohydrates can be increased, followed by a gradual increase in the protein intake; but restriction in protein intake is recommended for some time, even when there is almost complete recovery. No drug treatment is required apart from the giving of mild diaphoretics and purgatives. The kidney should not be stimulated. Ammonium chloride, so warmly recommended by the Mayo Clinic, has not proved successful, and novasurol should most certainly be used with great caution in renal œdema. "When coma develops, either subsequent to or independent of epileptiform convulsions, and when all ordinary measures, such as hot packs, the use of pilocarpine in small doses, and purging, fail to produce rapid improvement, venesection should be performed." Dr. Moorhead also advocated lumbar puncture in acute nephritis, complicated with nervous phenomena; he has always found it to be beneficial and that it has never resulted in any harmful effects. He has not obtained any satisfaction in the use of Fischer's solution, and the injection of plain sodium chloride and of sodium citrate solutions can be justified only as diluents of retained toxins. Morphia—the sheet-anchor for the allied condition, eclampsia—should be used in the treatment of convulsions; although having been under suspicion for long it is both safe and satisfactory.

Dr. H. LETHEBY TIDY (London) dealt with

Acute Hæmorrhagic Nephritis

the form of nephritis of which the outstanding and frequently the only characteristic of which is renal hæmorrhage. It is the condition described by Hale-White in 1911 as essential renal hæmaturia. All hospital records show that it is a common disease—in fact, that it is commoner than "acute parenchymatous nephritis." Cases may attend in an out-patient department once or twice and then, owing to the absence of any symptoms, disappear permanently. It is most common in children and young adults, and a throat infection is present in 75 per cent. of the cases. There is either a frank tonsillitis or a marked adenitis. Predisposing infections are not so commonly found in adults, and that is why such cases are investigated surgically. Renal hæmorrhage is frequently sudden, and a large amount of blood may be passed in the urine. Bacteriological examinations are nearly always negative—but sometimes the same organism is isolated from the urine and from the pus from an abscess in the neck. The classical symptoms of acute nephritis are absent. Œdema is usually entirely absent; when present, it is only a slight puffiness of the eyelids or more often a pallor of the face with a puffiness of the forehead. The hæmaturia disappears rapidly in the majority of cases—in some, especially in children, in whom it has remained for three to four weeks, it quickly disappears after tonsillectomy. The large majority of the cases recover completely, but a small number, about 5 per cent., remain with definite evidence of renal deficiency after the lapse of some years. These are the cases in whom the initial attack caused anxiety by general signs of ill-health, persistence of albumin and hæmaturia, and defective urea, concentration tests. This small group advances to chronic interstitial nephritis, eventually dying of uræmia. The pathogenesis of acute hæmorrhagic nephritis is uncertain, but, in general, the group appears to be intermediate between a nephritis and a hæmorrhagic state. The condition may be defined as an acute glomerulitis (Fahr described it as a "diffuse capillaritis of the glomerular loops"). Similar changes are seen in the kidneys in subacute bacterial endocarditis. But, unlike this condition, bacteria are not found in the affected glomeruli, and the urine is practically always sterile in hæmorrhagic nephritis. Again, the hæmorrhage is usually only microscopic in subacute endocarditis. It may be definitely stated that acute hæmorrhagic nephritis is not due to bacterial emboli. The diagnosis is easy in children, but in adults the surgical causes of hæmaturia have to be excluded before such a diagnosis is made.

Discussion.

Dr. HUGH GAINSBOROUGH (London) emphasised the importance of focal infection in acute nephritis, and is in agreement with Gray's explanation of the special sensitivity of the kidney to circulating organisms and toxins being caused by the concentration of the blood in the glomeruli and of the toxins in the tubules. Histological evidence of glomerular damage is too coarse a test, and the glomeruli may be injured in the sense of altered permeability, and yet appear normal when viewed by the microscope. This plus the evidence of experimental nephritis speaks against the arbitrary division of nephritis into glomerular, glomerulo-tubular, or pure tubular forms. We cannot yet explain why an acute nephritis becomes chronic—whether it is because of the severity of the original injury, or because of the continuance of the toxic factors, or as a result of metabolic changes brought about, for example, by the continued albuminuria. The metabolic disturbances in acute nephritis are more easily studied in subacute forms, where the disturbances are less transitory though similar in nature. The hypercholesterolæmia is as yet unexplained—the albuminuria may be important in this relationship.

Dr. A. E. GOW (London) emphasised the varying incidence of nephritis in scarlet fever at various periods. He regarded the classification of the different forms of nephritis to be important, and stressed the essential differences between the focal and the diffuse type of nephritis. He also called attention to the possible presence of syphilis as the possible under-concentration of various substances was not equally lowered; chlorides were least affected and urea was less affected than phosphate or creatinine. In the fall of concentration due to renal failure there was diminished chloride excretion, the concentration of chloride falling below that in blood plasma. Defective excretion of urea was not always recognised unless special tests were used, but it was easy to do this.

Dr. **HUGH H. YOUNG** (Baltimore) spoke of the services rendered by Colonel Fullerton to members of the American Medical Corps during the war. He agreed that much that was in text-books concerning urology should be rewritten. The discovery of reflex diuresis by Prof. Fullerton was very important. Dr. Mayrs's work was new and of great interest. He endorsed the remarks which had been made on the subject of pain. He himself had seen a number of cases in which pain was absent. In one of these, seen with Sir Wm. Osler, a calculus the size and shape of a cigar was found in the ureter.

Mr. **KENNETH WALKER** (London) emphasised the value of the wax-tipped bougie in cases where X rays did not reveal the calculus.

Mr. **SWIFT JOLY** (London) spoke of cases of silent stone in which the only symptom was pyuria. Symptomless pyuria was due to stone. X rays afforded the best means of diagnosis at the present time.

Mr. **J. B. MACALPINE** (Manchester) showed two lantern slides of a stone which, although not visible at first with X rays, was located with a catheterisation pyelogram.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

THE DIAGNOSIS AND TREATMENT OF STERILITY.

Dr. **ARTHUR E. GILES** (London) opened the discussion from the point of view of the general practitioner. The correct diagnosis, he said, depended upon a thorough and systematic investigation of the anatomical and physiological features affecting the transit of spermatozoa from the vagina to the Fallopian tube, the fertilisation of the ovum, and the transit of the fertilised ovum from ovary to uterus. Sexual maturity was indicated by general appearance and the development of the breasts and pubic hair. The vagina and uterus must be normal, and the tubes and ovaries not obviously abnormal, and there must be a history of regular and normal menstruation. If coitus were accompanied by normal desire and sensation it might be assumed that the ovaries were sufficiently developed and the endocrine function normal. Intercourse might have been impossible through want of virility in the man, but there were several possible reasons why it might be too painful for the woman. These included actual obstruction due to absence of the vagina or imperforate hymen; anatomical tenosis or functional spasm of the vagina (vaginismus); ores, abrasions, or vulvo-vaginitis. In tubo-ovarian nflammation or ovarian prolapse pain might be the sult of deep pressure. The os externum, to receive e spermatozoa, must be duly patent. Complete clusion was rare, but wide dilatation was not essential. Nevertheless conception often took place even when no opening was apparent, and a good aphorism was: "Do not say that a woman cannot become pregnant until you have youself removed her uterus and ovaries, and even then it is wiser to say it is improbable." Marked retroversion and acute anteflexion turned the cervix unduly forward, and during intercourse the external os was virtually shut off from contact with the semen by being pressed against the anterior vaginal wall. Rectification of the position of the cervix was often quickly followed by conception. The vaginal discharge might be strongly acid, and if not adequately neutralised by the cervical secretion might enfeeble or kill the spermatozoa. The only certain way of determining whether live spermatozoa were entering the cervical canal was microscopical examination of its contents two hours after intercourse.

The healthiness of the uterus was indicated by the clarity of the drop of mucus from the external os; a muco-purulent appearance suggested endometritis, which if serious might destroy sperm-cells. Even a mild salpingitis might seal up the tubal opening into the uterus; this could be detected by insufflation. There were no means of telling whether healthy ova were maturing and being received into the tubes, nor adequate knowledge of the conditions governing ectopic pregnancy and failure of an ovum to develop after the stage of nidation. Endometritis might allow impregnation, but forbid healthy placentation.

Treatment.

It was important to recognise the conditions in which sterility was incurable, so that the husband and wife might accept the fact and avoid constant alternation of hope and disappointment. Undersized uterus was not necessarily a bar; its growth was delayed rather than arrested, and the stimulus of marriage might be the best treatment. Thyroid might be given by the mouth, but ovarian substance must be injected, as it was destroyed in the stomach. Pronounced obesity should be reduced by diminishing intake. A rigid hymen should be excised; dilatation under an anæsthetic might remedy vaginal stenosis or vaginismus, and causes of pain should be abolished. If the husband had healthy spermatozoa, but could not introduce them, artificial insemination might be attempted. In dilating an unduly contracted os incisions should be avoided. "Nil nocere" was a good maxim. The remedy for marked anteflexion of the cervix was moderate dilatation with concomitant straightening of the uterus; the patient went to bed for 10 or 12 days with a glass intra-uterine stem pessary in place. Retroversion or retroflexion should be corrected so that the cervix was in a normal position during intercourse. If displacement returned, a Hodge pessary was a possible temporary measure, but it should not be worn for long, and operation was advised for persistent displacement. Noxious discharge was due to adenomatous disease of the vaginal aspect of the cervix or to endometritis, especially of the cervical type; the former should be treated by suitable applications, the latter by curetting, which should be performed thoroughly but gently. In swabbing the uterus afterwards strong reagents should be avoided. Tubal obstruction called for surgery. Endocrine inadequacy might now be detected by the chemical pathologist.

Dr. **SIDNEY FORSDIKE** reported that the semen had been defective in 46 out of 164 men whose wives had complained of sterility.

Insufflation.

Exploration of the uterus by dilatation of the cervical canal should only be undertaken if the tubes were known to be normal. It gave no information in the absence of symptoms and signs, but sometimes succeeded as a therapeutic measure. Inflation of the uterus and tubes, as introduced by Rubin in 1919, had become a diagnostic measure of the first importance, but was counterindicated by any signs of infection in the pelvis. Anæsthesia was only necessary when instruments could not be passed through the os. He used a pressure of up to 300 mm. on conscious patients if they did not complain, for if no air passed at that pressure the tubes were definitely closed. The same pressure was admissible under anæsthetic with the abdomen open so that it was possible to see what was happening, but he did not apply more than 200 mm. when the safeguard of tension pain was absent. Tubes might be temporarily blocked by kinking. It was all-important to decide upon the site of obstruction before undertaking any operation, for plastic operations upon the narrow part of the tube were not justified, but cases of closure of the fimbriated end offered some prospect of success. The most favourable were those in which the fimbriæ could be saved. The ovary should be freed and loosely fixed in the mouth of the new ostium.

dissolved in ether. The speaker believed in the infective theory of pancreatitis, the infection travelling from the gall-bladder via the lymphatic glands of the hilum. The pancreatic duct was guarded by a very efficient valve. The wall between it and the bile-duct became thinned out into a flap which acted as a valve so that regurgitation of bile could not take place. In gastric ulcer the pancreas was protected by fibrous tissue forming on the floor of the ulcer.

Dr. MACKENZIE WALLIS (London) said he had been interested for a number of years in the diagnosis of pancreatitis. In 1920 he had published the results of a long series of investigations on tests for pancreatic function and his conclusions had since been confirmed by others. No individual test was pathognomonic but three—namely, the diastase content of the urine, Loewy's test, and glycosuria if taken together gave a reliable index of pancreatic disease. These tests could be rapidly performed. If time permitted the findings might be confirmed by the finding of excess of undigested fat and muscle-fibres in the stools. The fleeting character of the tests must be borne in mind. They might be positive one day and negative the next. The results were often discarded because this was not recognised. Glycosuria fluctuated exceedingly, but the same was true of the diastase test. The speaker gave examples. In one case the diastase content fell from 200 units to 10, then rose again to 220, and finally remained constant at 10. He regarded these rises as due to recurrent attacks of subacute pancreatitis. The Loewy test was of no value by itself, but useful in conjunction with the others. In chronic pancreatitis the tests were of value, but here complete chemical examination of the stools was indicated. Catarrhal pancreatitis was common in association with jaundice. It also occurred after removal of the gall-bladder; hepatic bile was irritating because it contained no mucus, bile from the gall-bladder was non-irritating. If hepatic bile regurgitated into the pancreatic duct catarrhal pancreatitis followed. Diarrhœa and nausea after removal of the gall-bladder were due to this. Duodenal intubation gave important information especially in chronic interstitial pancreatitis. Cyanosis was due to acidosis set up by fat necrosis. The treatment was to place gauze soaked in horse serum in contact with the tissues. Horse serum had great capacity for absorbing pancreatic ferment.

The President, Prof. A. W. SHEEN (Cardiff) described pancreatitis following parturition and asked whether members had seen similar cases. He commented on the rapid pulse of pancreatitis.

Mr. F. C. PYBUS (Newcastle-on-Tyne) spoke on diagnosis and laid special stress on subscapular pain as a symptom in pancreatitis. Pain under the left subscapular was diagnostic unless ulcer on the lesser curvature of the stomach was present. Rapid pulse and cyanosis were also important. The pancreas should be remembered when dealing with any lesion in the upper abdomen and in anomalous cases of gall-stones, especially if the symptoms were worse than the diagnosis suggested.

Prof. A. H. BURGESS (Manchester) had had 21 cases in the last four years. The mortality was 20 per cent. Contrary to text-book teaching, males preponderated and the mortality amongst them had been much greater—44 per cent. compared to 16 per cent. in females. The disease was commoner than was generally supposed. A swollen pancreas and fat necrosis were often found in operations for gall-stones. There was usually a history of previous attacks and this was true of cases in which no gall-stones had been found.

Prof. A. FULLERTON (Belfast) said that all grades of pancreatitis existed between fulminating and mild cases. In his cases the outstanding feature had been the severity of the pain. Cyanosis was not marked. Even after sloughing of a large piece of the pancreas patients might do well.

Mr. R. ST. L. BROCKMAN (Sheffield) gave an account of a remarkable case of cyanosis in acute pancreatitis. He saw the man one and a half hours after the onset of abdominal symptoms. The patient was the colour of a boiled lobster and the colour had come on since the pain. Soon after the red colour changed to typical cyanosis. The speaker refrained from touching the pancreas at operation. He drained the gall-bladder and, if necessary, put a tube in the pelvis.

Mr. A. W. ADAMS (Bristol) described cases of pancreatitis following pregnancy.

Mr. GRANT replied. He did not agree with Mr. Chamberlain's conclusions, for in many cases both gall-bladder wall and bile were sterile. If the condition was due to hæmolytic streptococci the logical thing would be to remove the gall-bladder, but if this were done the patients died.

DIAGNOSIS OF URETERIC CALCULI.

The discussion was opened by Prof. FULLERTON. He said that contrary to text-book teaching the main constituent of his calculi was calcium oxalate. The symptoms of hæmorrhage and pain were easily accounted for. It was rare for a ureter to be completely blocked by a calculus but reflex anuria might occur. A remarkable phenomenon was reflex polyuria on the affected side. This sign was extremely important in diagnosis. It might be the only sign incriminating the kidney and the speaker described cases to illustrate this. Out of 20 undoubted cases of ureteric calculi with no renal stones diuresis, with diminished specific gravity of the specimen taken by ureteric catheter, was present on the affected side in 70 per cent. The explanation of both anuria and diuresis was afforded by a study of the vasoconstrictor and vasodilator nerves to the kidney. The stimulus of a calculus might cause vasoconstriction and reduction of secretion of urine on that side, or vasodilatation with increased blood flow and diuresis.

Pain was often due to distention of the renal pelvis, and the pain due to passage or arrest of a ureteric calculus could not be distinguished from that due to a renal calculus lodged in the pelvis of the kidney. A precisely similar calculus might give rise merely to discomfort in one patient while in another there might be the severest pain. The site of pain was extremely variable. In one patient it was in the knee, in another it radiated from the lumbar region to the shoulder and head. Pain in the iliac fossa was common and surgeons should be careful not to mistake ureteric calculus for chronic appendicitis. Frequency of micturition was not necessarily present. Hæmaturia might be the first symptom and in rare cases the only symptom of calculus, but might for a time be absent. In taking a specimen for examination it was important not to use a catheter, for any instrument might draw microscopical blood. In the clinical examination of the patient great care must be taken to exclude other abdominal conditions. A stone in the lower end of the urethra could frequently be felt through the rectal or vaginal wall. The speaker then discussed X ray diagnosis, and finally described the cystoscopic appearances. Changes at the ureteric orifice were present in 20 out of 50 cases and sometimes the calculus itself could be seen.

Dr. E. B. C. MAYRS (Belfast) gave the results of analyses of urine obtained by catheterisation of the ureters in 50 cases. Such an analysis seldom failed to distinguish between the normal and the affected kidney. Urines collected from the two kidneys were not always identical in volume and composition, but in normal kidneys the differences were small and were due to irritation from the catheters. Unilateral diuresis of reflex origin could be produced without injury to the kidney. The most important problem was to distinguish reflex diuresis from loss of concentrating power due to insufficiency of kidney epithelium. In diuresis the urine became more like blood plasma for the kidney had less time to produce alterations in the glomerular filtrate. But the strongly to the term "giving the patient the benefit of an exploratory operation." The surgeon might benefit; the patient was very often merely condemned to an added injury. "Open and see" was foolish and might be criminal.

For the gynæcologist the most common abdominal emergencies were hæmorrhage, infection, and thrombosis or strangulation. These required most careful differentiation. The two guiding principles were: (1) to make a meticulous inquiry into the history of the onset—this was often more valuable even than examination, and (2) to pass a catheter and examine the resulting urine. The chief symptom was pain. Pain was not always a liar, as Rochefoucauld had said, but the abdomen should never be opened for pain alone. By far the most important sign, qualitative and quantitative, was the abdominal facies, which never lied. In peritonitis it was anguished and apprehensive: in hæmorrhage it was pallid and waxy, and the muco-cutaneous line of the lip stood out with undue prominence. The ashen face of shock and the cyanotic face of severe toxæmia were also distinctive. It was important to note the patient's attitude. If the lesion were intraperitoneal, she lay on her back with the knees flexed, and any movement was a torture. If she could move readily and turn on her side, there was no grave abdominal lesion.

Hæmorrhage.—The commonest site of this was a ruptured tube, but it might also occur from a ruptured Graafian follicle, or from the rupture of a uterus in labour, or from perforation by a sound or curette. The history was all-important, and in ectopic pregnancy might be lacking altogether. The usual time for rupture from this common cause was between the seventh and twelfth weeks, and the most dangerous situations were the isthmus and cornua. The picture of the cataclsymic case was a rapid pulse, subnormal temperature, and air hunger; the abdomen was frequently tender and sometimes tympanitic. The clot could sometimes be palpated in the pouch of Douglas. The abdomen should be opened, a transfusion given, and the tube removed. A case four or five days old gave the picture of widespread peritonitis and bowel obstruction. In a so-called "chronic" case there was a rapidly growing mass on one side or other of the uterus; decidual casts facilitated diagnosis. A leucocyte count of 20,000 pointed to hæmorrhage rather than inflammation. An exploratory colpotomy did little damage and was useful; if dark blood were found, the abdomen should be opened at once.

Acute Infections.—The distinction between appendicitis and a tubal inflammation was all-important, for, while an infected appendix should be removed at once, it was a surgical disaster to open the abdomen for acute salpingitis. Prof. Chipman detailed the signs and symptoms on which a differential diagnosis should be founded. When in doubt, he said, watch and wait, hour by hour.

Thrombosis or Strangulation.—Patients were frequently aware of the presence of the neoplasm, which was usually an ovarian cyst or a fibromyoma. Pain was severe and colic-like but short in duration. If the condition were severe or examination delayed, the signs of peritonitis, due to infection from the colon, might be superadded.

In suspected bowel obstruction the hernial orifices should be examined. Intussusception was usually confined to the young and adolescent. Iliocæcal tumour led to a discharge of blood from the bowel; left-sided lesions might be palpated, and their symptoms were intermittent colic, altered bowel pattern, constipation, and sometimes vomiting from antiperistalsis. Diverticulitis of the lower colon was a lesion of old age and caused diarrhœa and fever. Stone in the ureter or renal pelvis was a common cause of the surgical violation of the abdomen.

In conclusion, said Prof. Chipman, the function of the good surgeon should be to diminish surgery.

Dr. EVERARD WILLIAMS (London) divided acute pelvic lesions into those accompanied by fever and shock respectively. Of the former, pyosalpinx or salpingitis might be suspected when a bilateral tumour or marked uterine tenderness occurred in a woman of child-bearing age. Operation should be delayed until the inflammatory process had become well established, as it was almost certainly a localising mechanism and not to be interfered with until it had obviously failed in its purpose. Acute pneumococcal peritonitis might simulate salpingitis, and its earliest symptoms might be referred to the pelvis. Signs on the right side alone made it necessary to distinguish between appendicitis and salpingitis. The latter was the last stage in a morbid process, evidence of which was usually to be found in the lower part of the tract. Left-sided symptoms, suggesting a tubal lesion, might be due to diverticulitis. X rays were of considerable aid in differential diagnosis, which was often complicated by œdema and hyperplasia.

The commonest lesion to be accompanied by shock was ectopic pregnancy. Few of the recent diagnostic aids were of much value; the phloridzin test indicated pregnancy only and the "shoulder pain" test gave positive results in other conditions. The diagnosis from torsion of the pedicle of an ovarian cyst was difficult. Other acute abdominal conditions causing shock were acute hæmorrhagic pancreatitis, volvulus of the small intestine during early pregnancy, and acute appendicitis. The importance of the early symptoms was exaggerated. The more urgent the symptoms of internal strangulation, the less likely was the lesion to be a strangulated cyst alone; some other condition was probably present. The two rules to follow were thorough examination of the whole abdomen and pelvis and, if the abdomen were opened, a thorough exploration of all the organs that might be diseased. The practice of removing the appendix through a "button-hole" incision was a bad one, as it allowed for no examination of the other organs.

Discussion.

Mr. L. C. RIVETT said that coliform infections were in his experience rare, and that the genital tract probably had a high degree of resistance to bowel organisms. Colpotomy entailed a great risk of infection of the blood mass. Like his colleagues, Mr. V. Bonney and Mr. A. Bourne, he was in favour of early operation on the tube. To wait until it became chronic lengthened the illness, and tubes were left alone, because of apparent subsidence, for years. They then presented one of the most formidable operations in gynæcology. Surely the tube was causing the peritonitis, not protecting from it? He believed, however, in leaving an acute ovarian cyst for a time.

Prof. J. HENDRY pronounced strongly in favour of leaving tubal infections alone for weeks or even months; this made a much easier and more satisfactory operation and allowed the patient to benefit by her own healing power. A valuable aid in determining the time of operation was the blood sedimentation rate; until this had absolutely returned to normal he did not like to operate. He himself treated ovarian cyst conservatively, giving complete rest and morphia for 24 to 48 hours. The patient was then much better able to tolerate operation. If left too long, however, torsion and multiple adhesions developed and the result to the patient was grave and unnecessary illness. The symptoms might pass as colic for months.

Dr. GRAY WARD (New York) voiced the strong American opinion against operation in acute salpingitis. The appendix could be dispensed with; the loss of the tubes meant sterility. Moreover, to wait gave the patient a better chance of surviving the operation if there had to be one. If it were to become the fashion to wear the tubes and ovaries outside, like the male genitalia, general surgeons would be less ready to operate radically.

Dr. A. GILES agreed with Dr. Williams in condemning the button-hole incision. His experience of tubal infection had been that the operative risk

Another valuable method was X ray examination with lipiodol, which was injected until the patient complained of tension pain.

Small ovarian cysts might prevent ova from ripening by pressure and distortion, and a limited peritonitis might veil off the ovary from the peritoneal cavity. Persistent corpus luteum, which was known to prevent œstrus and pregnancy in cattle, might have the same effect in women. "Incompatibility," or "selective sterility," was the name of the condition in which a presumably normal couple failed to procreate; most cases would not bear critical examination. Dr. Forsdike believed that they were really "combined relative sterility," both partners having low fertilising power.

Sterility in the Male.

Mr. Kenneth Walker's paper dealt with sterility in the husband, which various observers had found in differing degree in more than half the childless marriages they had investigated. Of 57 husbands referred to him by gynæcologists, he had found 25 normal, 18 with azoöspermia, and 14 with impaired fertility. Oligospermia might be due to the condom or to recent coitus; oligozoöspermia should only be diagnosed if indicated by every specimen examined, and oligonecrozoöspermia usually meant an inflammatory focus in the genital tract, probably in the vesicles. Venereal disease was responsible for most male sterility, but a comparatively mild infection of the tubules by other organisms might impair the spermatogenic function of the testicle, which was much more delicate than the internal secretion. Kyrle, who had studied a thousand testicles, stated that a normal testicle was hardly ever seen in a man dead of acute infective disease. Alcohol and similar poisons, endocrine disturbances, heat, diet, and local conditions might be responsible.

Artificial insemination was successful in veterinary but disappointing in medical practice, and the reason was probably that in the former it was always performed after natural coitus. The secretions from the genital passages were probably essential to fertility.

Removal of obstruction or of infections, the improvement of the general health and the administration of gland substance, preferably anterior lobe pituitary extract, were the chief remedial measures. Little or nothing was known of the physiology of reproduction or the function of the secondary glands of sex, and only by combined research could the knowledge be obtained which was indispensable to the scientific treatment of sterility.

Discussion.

Prof. H. Beckwith Whitehouse (Birmingham) stated that pregnancy had occurred in two cases in which he had excised the isthmic end of the tube and inserted the stump into the uterine cavity. Lipiodol prevented the adhesions so common in salpingotomy. He did not think the stress that Mr. Forsdike had laid on saving the fimbriæ was justifiable; as long as the lamina were intact pregnancy was possible. A promising method of artificial insemination was to paint the endometrium with the secretion of the cervical canal just after intercourse.

Prof. R. Vaudescal (Paris) warmly commended lipiodol as safe for the general practitioner. Pregnancy could sometimes be obtained when the tube was destroyed by grafting the ovary into the wall of the womb.

Dr. Margaret Basden (London) remarked on the frequency of blocked tubes. She always used an anæsthetic for insufflation to eliminate tubal spasm. Corpus luteum had corrected amenorrhœa and sterility in obese patients when given in 5-gr. doses three times a day.

Dr. R. C. Buist (Dundee) summed up the treatment of the idle and sterile in the advice, "Live on a shilling a day and earn it." Much vaginismus could be avoided by antemarital education; a wife who was hurt in her first coitus might pass the rest of her life in terror of it and remain childless.

Mr. E. Farquhar Murray (Newcastle-upon-Tyne) said that he had been struck by the frequency—nearly 50 per cent.—of mild vaginal and uterine infections. Tubes sometimes appeared blocked on one test and open on another taken six months later. Of six patients he had opened for blocked tube, five had shown definite signs of miliary tubercle, and he would never hesitate to perform an investigatory operation on a patient with a blocked tube and a tuberculous history.

Dr. F. Edge (Birmingham) recounted the method employed by the late Prof. Taylor, who had penetrated the ovary with a cautery, split it, and stitched it up again, to provide a normal exit for the ovum. It was advisable in all operations for sterility to tell the house surgeon and nurses what was being done, to avoid trouble from the patient later on.

Dr. Mortkane (New Zealand) held that one test for blocked tube was not sufficient.

Dr. Gray Ward (New York) spoke of the good results of X ray stimulation of the ovarian function recently obtained by Dr. Rubin. The method was widely used in America. Not more than three treatments were given, at intervals of a week or a fortnight.

The Chairman hailed insufflation as the most important gynæcological discovery of recent years. Its inventor had enjoined repetition when a negative result was obtained. As an alternative to lipiodol barium powder had been used for photographing the pelvis. No operation should be undertaken without investigation by one of these methods. Dr. Rubin had suggested that insufflation might remedy sterility by displacing a plug of inspissated mucus.

Dr. Giles, Dr. Forsdike, and Mr. Walker replied.

Prof. Vaudescal then read a paper on

MYOMECTOMY DURING PREGNANCY.

This operation, he said, was to be avoided when possible. The indications were (1) diagnosis of a large fibroid before the third month; operation at this time averted later complications; (2) unmistakable signs of necrobiosis; (3) distortion of the uterus likely to cause miscarriage; (4) torsion of the pedicle of the tumour, which caused severe and lasting pain; (5) pressure on neighbouring organs. In operation general anæsthesia was preferable to spinal because it suppressed uterine contraction. The tumour was decapsulated by a single incision over its summit, and all bleeding carefully stopped. When the fibroid was between the layers of the broad ligament, it must be approached by the transligamentous route. No drainage was provided, and one-sixth of a grain of morphine was given every six hours or less during the three days after the operation. Out of eight myomectomies the child had been saved in seven. Out of 21 cases of myoma, however, hysterectomy had been obligatory in 13, and so operative interference should be postponed as long as possible.

Mr. L. C. Rivett (London) recognised only one indication besides necrobiosis—excessive size.

Dr. Giles, Mr. Farquhar Murray, Prof. Whitehouse, and Mr. Tenison Collins also took part in the discussion.

ACUTE CONDITIONS IN THE PELVIS.

Prof. W. W. Chipman (Montreal) quoted Mr. Victor Bonney's saying that the propinquity of the anus to the genital tract was a great defect in human development. He added that, as far as he know, there was at present no remedy, but that this fact, together with venereal disease, explained the liability of the pelvis to acute infections. Moreover, the pelvic cavity was the largest lymphatic space in the body and had a corresponding absorptive power, so that infection was always serious. It was a sort of Valhalla for organisms, providing warmth, moisture, and food. The "emergency abdomen" was always a grave emergency; an abdomen once opened was never the same abdomen, and the decision whether or not to open it was no light one. He objected in inoperable cancer and recommended frequent douching to protect the surrounding skin. Rest in bed was important, but not for too long, as it was far better for the patient's psychic health to be up at her ordinary work.

Prof. J. HENDRY (Glasgow) recalled a suggestion of Dr. Archibald Leitch that many supposedly malignant glands were really enlarged from ordinary septic absorption. This might account for much of the rapid improvement under radium.

Dr. GILES agreed that the importance of the involvement of the higher abdominal glands was much exaggerated. The trouble that mostly occurred after radical operation was low down at the scar. A method that had given good results in the old days was to scrape away as much of the growth as possible with a vigorous curettage, and then to pack the cavity with gauze soaked in a saturated solution of zinc chloride. The vagina was protected by being filled with carbonate of soda. This prolonged life in comfort for perhaps three years, and freed the patient from the constant irritation of septic discharge.

The Chairman, Prof. W. FLETCHER SHAW (Manchester), admitted that he was an ardent operator, but had come to a stage of doubt. Anyone with any humanity who had seen these women in the long-drawn-out convalescent stage would never operate if he thought he could get anything like such good results with radium. The trouble was that the results in England did not approach those of Sweden and America. He doubted, also, whether the policy in this country of leaving radium entirely in the hands of the radiologists had been right, and thought that, if English gynæcologists treated their own patients with radium as their colleagues did abroad, their results would soon be equally good. Those obtained by the Medical Women's Federation had given great promise. Though he did not yet feel justified in saying that he would not operate on every early case, he hoped that in the future every early case would be treated with radium.

Dr. WARD, replying, said that he would not take out a uterus as a precautionary after-measure if the patient was perfectly well; that most glandular enlargement in early cases was non-malignant, and that in America a campaign was on foot to get every woman past 40 to come for systematic examination.

Dr. MURRAY, replying, said that at least half the glandular enlargements were malignant, and suggested that some underwent natural cure. He was opposed to applying radium to the uterus of a young woman unless hysterectomy was the only alternative.

DONATIONS AND BEQUESTS.—Among other bequests Sir George A. Wills, of Bristol, left £1000 each to the Bristol Eye Hospital, the Bristol Royal Hospital for Sick Children and Women, and the Bristol District Nurses' Society, and £250 to the Bristol Eye Infirmary.—Mrs. Elizabeth Frances Acton, Torquay, left £500 each to the Torbay Hospital, the Aberlour Orphanage, Strathspey, and the Hostel for the Dying, Clapham.—Mrs. Christina Elizabeth Feeney, of the Moat, Berkswell, Warwick, left £1000 to the Birmingham Women's Hospital and £500 each to the Birmingham General Hospital, Queen's Hospital, and the Children's Hospital, Birmingham.—Over £7000 will pass to charitable objects under the will of Mrs. Ethel Alexandra Johnson, of Allestree Hall, Derby. The bequests include £1000 to Derbyshire Royal Infirmary, and £500 each to the Derbyshire Hospital for Sick Children, Nightingale Nursing Home, Derby, and Queen Victoria Memorial Home of Rest, Derby.—Mr. Thomas Leigh Parry, Liverpool, besides other bequests, left £1000 to the Royal Infirmary, Liverpool, for the endowment of a bed in memory of his late brothers, and a further £1000 for the endowment of a bed in memory of his sister and himself.—Mr. Andrew MacFarland, of Pembroke, Co. Dublin, left £2000 each to Dr. Barnardo's Homes and to the Magdalen Asylum, Lower Leeson-street, Dublin: £1000 to the Royal Hospital for Incurables, Donnybrook, Dublin, and £500 to St. Dunstan's Hostel for Sailors and Soldiers Blinded in the War.—One thousand guineas is to be handed over for the extension fund of the Huddersfield Infirmary by the villagers of Denby Dale as a result of their great pie-making exertions.—The residuary legatees of Mr. John Cory have allocated the sum of £1000 to the London Lock Hospital.

Special Articles.

SCOTLAND.
(FROM OUR OWN CORRESPONDENT.)

A School Experiment.

A SCHEME of research is to be undertaken in the Fifeshire schools with the aim of guiding pupils in the choice of suitable vocations. The experiment differs in two respects from a similar one in the City of London, also organised by the National Institute Industrial Psychology. It is hoped to secure th coöperation of teachers on a more active basis tha in London, particularly in obtaining information o occupational success; and whereas in London al schools were necessarily urban, in Fifeshire two groups of schools have been selected—one rural, the other urban—with the hope of learning by comparison something of the occupational problems of the two types. The examination and study of individual children are to begin between the ages of 11 and 12, and to continue with periodic re-examinations until the termination of school life. Teachers will be asked to supply all the information they can gather of the previous history, health, school record, and home circumstances of the pupils. The medical officer will furnish particulars of the child's physical condition, with an estimate of fitness (or otherwise) for occupations requiring certain degrees of strength, sensory acuteness, and the like; whilst the school records and tests by investigators will indicate mental capacity as well as qualities of temperament and character. Out-of-school activities will come within the scope of the inquiry, and note will be taken of the pupil's hobbies, occupations, ambitions, and opportunities. Some time prior to the pupil leaving school, when the data have been summed up and considered, advice will be given, in consultation with teachers, parents, and child, as to the selection of a suitable vocation. The Carnegie Trustees are assisting the education authority with financial support.

Occupational Therapy.

The report of the General Board of Control sets out how the practice of occupational therapy is being steadily extended in the Scottish mental hospitals. The benefits to the patients have been a matter of frequent comment, and it only required the exhibition of work from all the institutions which recently took place at Bangour to demonstrate into what varied and useful channels it is possible to direct the energies of patients who before the introduction of occupational therapy were apparently unable to do anything of a useful nature, and whose habits were destructive and costly. Many guardians have now set apart a room in which boarded-out patients can sit during the long winter evenings. "These long, dark winter evenings," Dr. H. Ferguson Watson says, "are taken up with such amusements as solving cross-word puzzles, playing games at chess, draughts, dominoes, and carpet bowls, listening to much varied music, lectures, and sermons on the wireless set, and to the gramophone. Some of the patients are accomplished musicians themselves, and entertain their companions with selections on violin, piano, melodeon, concertina, mouth organ, and even a tin whistle. Indeed, some are so expert that their services are in much demand for local gatherings." A proportion of guardians take their patients to the theatre, to concerts, and to lectures, while in all cases where the mental condition will permit the patient is allowed to attend divine service

Observation Mental Wards.

Another subject dealt with by the Board of Control in their report is, as you have noted already, the successful operation of the observation wards established by the parish councils. These have partially served the purposes of the dispensaries and clinics well known in France, Belgium, and the United was much less if the acute phase was allowed to settle down a little. A tube, unlike an appendix, hardly ever perforated. On the other hand, a cyst with twisted pedicle called for immediate operation to prevent necrosis of the tumour, adhesion to the bowel, and peritonitis.

Prof. CHIPMAN, replying, deplored the number of patients who came with retroversion or prolapse that might have been detected and put right at a recent appendix operation if the general surgeon had thought to explore the pelvis as well. He encouraged Mr. Williams to give a fair trial to the operation on the acute tube, but said that his own experience of it had been decidedly unfavourable.

RADIUM THERAPY IN CARCINOMA OF THE CERVIX UTERI.

Dr. GRAY WARD read a paper with this title in which he outlined the results obtained at the Women's Hospital in New York during the past ten years. To assess the value of radium it was necessary to compare its results in operable cases. There were only a few extending back over five years, and his object was to fill this gap. He referred to the recently published statistics of Dr. Janet Lane-Claypon and Dr. Heyman, and compared them with his own. His hospital possessed only 280 mg. of radium salt, which was applied in rubber-sheathed platinum tubes in doses of 2200–4200 mg.-hours, but massive doses had proved elsewhere to give no better results. No high voltages nor X rays were used except to produce lymphatic block, where neighbouring viscera would not be damaged. An essential part of the treatment was close and individual supervision of every patient, and monthly observation for the rest of her life; this, by detecting recrudescence long before the patient was aware of it, was largely responsible for his hospital's results. Thirty per cent. of the patients had had more than one application, and many had had three or more. Subsequent doses were based on the initial reaction. Radium tubes were anchored by sutures at intervals not closer than 2 centimetres, and short needles were preferred to long. A self-retaining catheter was inserted at the same time as the radium. To combat sepsis during the sloughing stage, when toxins were being absorbed, blood transfusion was a valuable adjuvant. 500 c.cm. were given before dosage whenever possible. Daily douches were given to stimulate sloughing.

It was rarely possible to predict the course from the type of cell, as various kinds were usually present in different parts of the same growth.

Results.

The group numbered 134, treated between 1919 and the first five months of 1923, and the figures had been audited by professional statisticians. All cases were of carcinoma originating in the cervix, and none had been treated elsewhere. Of this number 126 had been traced, and 31 were still alive, a percentage of 24·6. Of Classes 1 and 2, where the growth was limited to the cervix, 17 were living out of 32 treated and 30 traced: 56·7 per cent. Heyman's figures had given 18 per cent. of successes from radical operation and 16·3 per cent. from radiological treatment; at his own clinic that author had returned 23·1 per cent., and the successes at the Radiumhemmet had been 22·4 per cent. Against this, however, had to be set a 17·2 per cent. primary mortality with surgery, against less than 2 per cent. with radium. The really vital comparison, of course, was in the "operable" group. Taking Heyman's figures operation had given 35·6 per cent. and radiology 34·9 per cent. At the Women's Hospital Clinic the successes in operable cases had numbered 53·1 per cent.

The stabilisation of therapy was hindered by a lack of standardisation in statistics. Dr. Ward advocated the recognition of two classes only, early and advanced, and that no results of less than five years' standing should be accepted, but approved of the four classes of Dr. Schmidt, of Chicago. Operability and primary mortality rates should, he said, always be given.

Mr. FARQUHAR MURRAY (Newcastle-on-Tyne) delivered a paper on the same subject, describing observations based upon over 200 cases treated with radium since January, 1926, and a series of 130 radical Wertheim operations. His supply of radium had been limited to 100 mg. in hospital and 200 mg. of the salt in private practice. All cases were subjected to a thorough examination under anæsthetic. 100 mg. were applied for 24 hours to the os, or cavity if one existed. The patient then rested for 14 days. Operation was of doubtful value when there were glandular deposits. Operability should be based on the local condition as assessed by the possibilities of a radical operation, and should not take into account the age or general condition of the patient. The term meant that the growth was limited to the cervix or only involved the vagina to a limited extent, and that there was only a slight infiltration into the cellular tissue.

Twenty operable cases had been treated by radium before January of the current year. Two had not been traced, three had improved, three were stationary, and 12 were worse or had died. Mr. Murray did not use radium before operation, as it seemed to make the local condition worse and the operation area more vascular. It should be used if the ulcer were spreading on to the vagina, and there were some infiltration. The results had appeared to be unfavourable to radium, but this was because it had raised the standard of operability. It seemed, however, to increase operative risk. It undoubtedly improved the local condition in inoperable cases. Of 23 inoperable cases treated in 1926 four were alive, but three of these were going downhill. In 1920, however, radium had so improved five cases considered inoperable that the radical operation had been performed; two were alive and well with no evidence of recurrence. In his experience, radium was invaluable and produced results little short of miraculous in certain cases. It was particularly useful in elderly women, in whom the malignant cells were peculiarly susceptible to its action. It had also given very encouraging results in 55 cases of menorrhagia.

In conclusion, radium was practically as certain as hysterectomy, and was especially indicated in disease of the heart, lungs, and kidneys, where long anæsthetics must be avoided, and in all nervous and elderly patients. It was not to be a routine measure for cases complicated by fibroids.

Discussion.

Dr. MABEL RAMSAY (Plymouth) urged the advantages of radium therapy in avoiding operative shock and scar contraction, and in being within the capacity of any surgeon of ordinary ability. The Medical Research Council had given radium to three women's hospitals, and the general feeling was that all cases of cervical cancer should be taken to one of these.

Dr. MARGARET BASDEN (London) testified to the wonderful results in early disease obtained in the hospitals mentioned. She preferred the Wertheim operation, however, in operable cases, especially where glands were involved. She did not approve of radium for non-malignant menorrhagia, fearing its effect on the ovaries, especially of younger women.

Major P. FLEMING GOW (Calcutta) mentioned a diagnostic method he had learned in Vienna. The suspected area was painted with glucose iodine; any malignant tissue, even though not clinically recognisable, remained white. This was because the cancer cells contained no glycogen and therefore could not fix the iodine. In Vienna he had seen several cases cured by operation with an after-effect of chronic cystitis. He asked whether this occurred with radium.

Dr. W. T. HALL (Newcastle-upon-Tyne), speaking to general practitioners far from radium, extolled opium as a palliative for both bleeding and pain

THE MEDICAL REGISTER: UNTRACEABLE PRACTITIONERS IN 1928.

WE are requested by the Registrar of the General Medical Council to publish the following list of medical practitioners who have not replied to his inquiries as to the accuracy of their addresses. Anyone, wherever resident, who finds his or her name included in this list should communicate immediately with the Registrar of the General Medical Council, 44, Hallam-street, Portland-place, London, W. 1, otherwise the name will be omitted from the next issue of the Medical Register. There may be some who have answered while this list is in the press. Those marked "S" should communicate direct with the Registrar of the Scottish Branch Council, 12, Queen-street, Edinburgh.

Atkins, Thomas E., L.A.H., 1877(I).

Basu, Dharmadas, L.R.C.P.S., 1876(S).
Baxter, George S. M., L.R.C.P., 1882(I).
Bayfield, Thomas F., L.R.C.P.S., 1916(S).
Benson, John P., M.B., 1922(I).
Bernstein, Harry L., L.M.S.S.A., 1924(E).
Burke, Frederick A., M.B., 1912(I).
Busby, George A., M.B., 1925(I).

Cable, Walter G. H., L.S.A., 1906(E).
Campion, Oliver St.L., M.R.C.S., 1917(E).
Carroll, John D., *M.C.*, M.B., 1913(I).
Chew, William R., M.B., 1888(S).
Colbert, Redmond J., M.B., 1921(I).

Davin, Alfred L. V., M.B., 1916(S).
Davies, Thomas H. R., M.R.C.S., 1922(E)
Dempsey, George A., M.B., 1922(I).
Divecha, Rustom F., L.M.S.S.A., 1920(E)

Farrell, Edward D., M.D., 1908(Col).

Garas, Habid, M.B., 1916(E).
Gentil, Joseph E. H., L.R.C.P.S., 1899(S).
Greene, Gerald, M.B., 1926(I).
Grimoldby, James, L.M.S.S.A., 1908(E).

Hackney, Gordon H., M.R.C.S., 1901(E).
Haines, Humphrey, L.R.C.P., 1879(I).
Hall, John W., L.A.H., 1886(I).
Halloran, (Mrs.) Kathleen M., M.R.C.S., 1926(E).
Hallsworth, Francis A., M.R.C.S., 1876(E).
Hallwright, Matthew L. G., M.R.C.S., 1895(E).
Hamada, Gawad, M.R.C.S., 1925(E).
Hamlin, Alfred E., M.R.C.S., 1916(E).
Hamman, Dirk J. H., M.B., 1902(S).
Hancock, Eric L., M.B., 1911(E).
Hanington, John W. B., M.R.C.S., 1912(E).
Hannigan, Timothy H., L.R.C.S., 1887(I).
Harcourt, Averyl, M.B., 1906(S).
Harper, Frederick G., *M.C.*, M.B., 1907(S).
Harper, Gerald S., M.R.C.S., 1874(E).
Harris, Arthur T., M.B., 1919(S).
Harris, Lucy E., M.B., 1898(E).
Harris, Matthew H., M.B., 1903(E).
Harte, Joseph, M.B., 1922(E).
Hartford, William, L.R.C.P., 1887(I).
Hartley, Evelyn F., M.B., 1926(S).
Harvey, Henry F., M.R.C.S., 1876(E).
Hauser, Philip, L.R.C.P., 1863(E).
Hawkes, Henry, L.R.C.P., 1924(I).
Hayden, Richard H. H., L.R.C.P., 1892(I).
Haydon, Arthur G., L.S.A., 1892(E).
Hayes, Julian P. S., L.R.C.P., 1885(E).
Hayes, Simeon A., L.M.S.S.A., 1922(E).
Hazel, William F., M.R.C.S., 1871(E).
Healey, Coryndon W. R., *C.M.G.*, *C.B.E.*, L.K.Q.C.P., 1888(I).
Healy, Francis, M.B., 1920(I).
Heeland, Patrick A., L.R.C.S., 1886(I).
Helm, John K. A., L.M.S.S.A., 1908(E).
Hennessy, Cornelius, L.R.C.P., 1918(I).
Henry, Lydia M., M.B., 1916(E).
Hermitte, Louis C. D., M.B., 1918(S).
Heslop, William J., L.K.Q.C.P., 1883(E).
Hession, John E. I. E., M.B., 1925(I).
Hickey, William, M.B., 1919(I).
Highfield-Jones, Gabrielle M., M.R.C.S., 1924(E).
Hill, James M., M.B., 1921(I).
Hinchoo, Harold, M.R.C.S., 1924(E).
Hoare, Reginald C. M., L.R.C.P.S., 1899(S).
Hodgman, Jan H., M.B., 1923(I).
Hogg, Alexander W., *O.B.E.*, M.B., 1904(S).
Hogg, Charles A., M.B., 1893(E).
Holland, Edward, M.B., 1921(I).
Honeybourne, Victor C., L.R.C.P., 1906(E).
Hood, James C., M.D., 1883(I).
Hookham, Paul, M.R.C.S., 1876(E).
Hope, Percy L., L.R.C.P., 1899(E).
Hopkins, John, M.R.C.S., 1876(E).
Horsham, Joseph, L.R.C.P.S., 1905(S).
Hort, Frederick A., L.S.A., 1901(E).
Hottinger, Edward F., L.M.S.S.A., 1925(E).
Hubbard, Thomas C., L.R.C.P.S., 1874(S).
Huffton, Edith, L.R.C.P., 1915(E).
Hughes, Hugh L., L.S.A., 1886(E).
Hulbert, Henry L. P., M.R.C.S., 1901(E).
Hunter, Douglas A., M.B., 1921(S).
Hunter, Ellis G., M.B., 1923(S).
Hurwich, Jack, M.B., 1920(S).
Huskisson, Douglas S., M.R.C.S., 1924(E).
Huston, John A. F., M.B., 1926(I).
Hutt, Herbert A., M.R.C.S., 1899(E).

Ibrahim, Aziz Y., M.R.C.S., 1921(E).
Irving, Hamilton, M.B., 1904(E).
Island, Robert L., L.K.Q.C.P., 1886(I).

Jackman, James J. H., L.R.C.S., 1884(I).
Jackson, Harold E. A., M.R.C.S., 1901(E).
Jaffe, Mossy, M.B., 1923(I).
Jaffit, (Mrs.) Bertha (formerly Kahn), M.B., 1923(E).
James, Henry W., M.R.C.S., 1903(E).
James, William A., M.R.C.S., 1906(E).
Janse van Rensburg, William J., M.B., 1924(I).
Jardine, Robert, M.B., 1886(S).
Jeaffreson, George C., M.R.C.S., 1892(E).
Jehansart, Irma M. C., M.B., 1920(E).
Jenkins, Winifred M., M.R.C.S., 1922(E).
Jennings, Edward, M.R.C.S., 1878(E).
John, Cherukaud M., L.M.S.S.A., 1923(E).
Johnson, Emily E., M.B., 1926(E).
Johnson, George L., M.R.C.S., 1881(E).
Johnson, (Mrs.) Hester M., (formerly Church), M.R.C.S., 1916(E).
Johnson, Philip, L.R.C.P., 1890(E).
Johnson, William, L.R.C.P., 1890(I).
Johnston, John S., L.K.Q.C.P., 1874(I).
Jones, Gilmore L. C., M.R.C.S., 1926(E).
Jones, John D., M.R.C.S., 1877(E).
Jones, John H., M.R.C.S., 1899(E).
Jones, (Mrs.) Olive L. (formerly Baile), M.B., 1920(I).
Jones, Thomas, L.S.A., 1897(E).
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Kelly, John, L.R.C.P., 1913(I).
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Leeman, Percival G., *M.C.*, M.B., 1913(I).
Leftwich, Phillip, M.R.C.S., 1923(E).
Leggatt, Charles A. S., M.B., 1886(E).
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Lorimer, Janie, M.B., 1898(S).
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Louw, Hendrik J., L.R.C.P.S., 1920(S).
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Lowenstein, Lillian, M.R.C.S., 1919(E).
Lubbe, Willem P., M.B., 1917(I).
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McColl, Alfred G., M.B., 1918(E).
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Macfie, Ronald C., M.B., 1897(S).
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MacKay, Janet M., M.B., 1924(S).
Mackay, Kenneth A., M.B., 1924(S).
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McKechnie, William E., M.B., 1897(S).
McKee, William C., M.B., 1919(I).
McKenna, Edward J., M.B., 1902(I).
McKenna, John H., L.A.H., 1916(I).
Mackenzie, Ian F., L.M.S.S.A., 1915(E).
Mackenzie, Joseph R. M., *M.C.*, M.B., 1916(I).
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McLaughlin, Agnes, M.B., 1923(I).
MacLaverty, Rose A., M.B., 1921(I).
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Macmullen, James C., L.R.C.S., 1881(I).
McNair, Herbert, *M.C.*, M.B., 1921(S).
MacNeill, Catherine, M.B., 1924(I).
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Macphail, Dugald H., M.B., 1902(S).
MacRury, Colin W., M.C.P. & S., 1916(Col).
McWhirter, James, M.B., 1924(S).
Madden, Richard R. M., L.R.C.P., 1891(I).
Madhok, Mohkam C., M.B., 1922(E).
Magan, Michael J., L.R.C.S., 1887(I).
Majmundar, Premrai T., M.B., 1916(E).
Malik, Sultan B., M.R.C.S., 1926(E).
Manker, Vinayak L., L.R.C.P., 1899(E).
Manook, George, M.B., 1885(S).
Marsh, Sylvia, M.B., 1915(I).
Marshall, Edward H., *D.S.O.*, M.R.C.S., 1914(E).
Martin, George A., M.R.C.S., 1924(E),
Martin, John H., M.B., 1900(E).
Mason, Robert D., L.M.S.S.A., 1926(E).
Massey, David, L.R.C.P., 1898(I).
Matthews, Thomas M., L.R.C.P., 1920(I).
Maximos, Youanis, M.R.C.S., 1922(E).
Maynard, John S., M.B., 1891(S).

States. These wards are conducted on hospital lines, and their beneficial effect may be seen from the fact that no fewer than 1240 patients passed through them at Stobhill and Duke-street during one year, and of these 788 returned to their homes without the necessity for certification. In the foreign clinics the advantages are even greater, inasmuch as patients requiring advice do not become "paupers" in the process, while mild cases of nervous and mental breakdown seek skilled advice more freely and receive the special treatment, which, owing to its cost, can be adequately provided only by public authorities. For such patients there is no public provision here beyond the observation wards, the majority being unable to afford the expense of private nursing homes. Early stages of functional nervous and mental disorder are left uncared for or treated in such a desultory manner that in the long run the majority seek admission as voluntary boarders or are certified to asylums. In Scotland the extension of the General Board's powers so as to include all matters relating to mental health should present no great difficulty. This was the course recommended by the Royal Commission last year. If the £115,000 granted annually to improve the care of the lunatic could be allotted at the discretion of the Board to assist all mentally defective persons other than those provided for as mental defectives, no matter what their circumstances or station in life, the objects of the Board would be better furthered.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Professional Secrecy.

THE annual meeting of the Aerzte-vereinsbund was held this year at Danzig, where the most interesting order of the day was professional secrecy, the speakers including medical men and criminologists. Dr. Vollmann, the editor of the Bund's journal, pointed out that professional secrecy is no longer absolute since the laws on workmen's insurance and recently on venereal diseases compel medical men in certain cases to reveal facts concerning their patients. But apart from those exceptions the patient has a right to be protected against indiscretion on the part of his medical attendant as well as of assistants, nurses, and students. Dr. Ebermayer, ex-Public Prosecutor at the High Court of Leipzig, said that the provisions of the criminal law which make a medical man liable to punishment if he violates professional secrecy concern qualified men only. A patient consulting a non-qualified person should be aware that neither can he rely on his professional secrecy nor can he prosecute him should he reveal facts concerning his illness. In the new Criminal Bill shortly to come before Parliament these provisions will be extended to include assistants, nurses, and students. It will also be made illegal for a medical man to confirm a rumour concerning one of his patients. A patient may discharge his medical attendant from the obligation of professional secrecy, but may at any moment revoke this discharge. If a patient has died the good renown of the deceased demands that the medical attendant should observe professional secrecy in the same way as if he were still alive. There are, however, circumstances, legal and social, where these professional rules may be infringed. According to recent legislation taxing authorities are authorised to examine the books kept by medical men. The production of histories of patients written by medical men or in hospitals may be enforced by an order of court and in urgent cases by the police. The principle stands that professional secrecy must be kept as strictly as possible and infringed only when the law obliges. Dr. Hagemann, head of the detective department of the Berlin police, said it often happened that a criminal was injured at the commission of a crime and inquiry was made by the police at hospitals and from medical men for the names of any persons who might have been dressed for injuries about that time. Their inquiries were often, however, fruitless because medical men declined to answer such questions on the plea of professional secrecy. But there are, he said, overruling moral obligations. In the instance of a terrible murder a Berlin medical man, after having scrupulously considered all the circumstances, very reluctantly revealed the name of the criminal dressed by him, so that he could be arrested by the police. He was sure no one would blame the medical man for his action. The meeting ended with the passing of a motion to the effect that the rules of professional secrecy should not be remitted except for reasons of public welfare, that judicial orders to produce books kept by medical men should be prohibited, and that the forthcoming reform of the criminal law should contain provisions to that effect.

The Socialist Party and the Medical Profession.

The number of medical members in the recently elected Reichstag is only four, of whom one is a democrat, one a member of the Bavarian popular party, and two Socialists. Owing to the increased influence of the Socialist Party it is of interest to know their medical programme. It is explained by Prof. A. Grotjahn, who, although not belonging to the Reichstag, is an influential member of the party and occupies the chair of social hygiene at Berlin University. Prof. Grotjahn demands that medical practice should be nationalised by an extension of the existing social insurance system, now limited to certain classes of workers, to every member of the population. Hospitals, dispensaries for infants, for tuberculous and venereal patients would form the nucleus of socialisation. All private institutions, such as sanatoria and convalescent homes, would be taken over. The medical profession would work in these institutions under better conditions than hitherto. They would have the rights of civil servants, their work would be done in common, and thus more economically; they would also enjoy the leisure hitherto denied to them. Pharmacies and factories producing chemical agents and sanitary appliances would be owned by the State. Prof. Grotjahn, who belongs to the moderate wing of the Socialist Party, believes these measures would have to be introduced gradually; for a period the socialised and the capitalistic institutions would exist side by side. It may be pointed out that these principles to some extent have been put into practice by the sick clubs of Berlin, especially those the greater part of which are under Socialist management. They have set up dispensaries for nearly every kind of disease at which appointed medical men are working. They have fitted out those dispensaries with modern apparatus and with laboratories. They have stocked drugs the provision of which is not reserved by law to licensed chemists. When such a drug is prescribed by a medical man the patient is obliged to fetch it not from a pharmacy or a drug store, but from the drug store of the sick club. Prof. Grotjahn's plan aims at extending this system to the whole population.

Statistics of Suicide.

Dr. Prinzing, of Ulm, the well-known medical statistician, has published a report on suicides in Germany and abroad. Of the German States Saxony has the greatest number—namely, 31·9 for each 100,000 of the population during the period 1900 to 1910. This figure increased from year to year, reaching 36·6 in 1925 and 38·1 in 1926. In Prussia the corresponding figures were 21 and 25·4. The lowest numbers were those of Bavaria and of Wurtemberg. The figures of Switzerland were nearly the same as those of Germany. In Austria and in Hungary they were much higher. France had about 20 suicides for every 100,000, Belgium 13–14. The lowest number in Northern Europe were those of the Netherlands with 6 and of Norway with 5 suicides for every 100,000. In Southern Europe the number of suicides was always very small, but in recent years a certain increase has been observed in Italy and in Spain. Immediately after the war suicides were more frequent among women than among men.

Maj. J. D. C. Swan, late R.A.M.C. T.A., to be Temp. Capt., and temporarily relinquishes the rank of Maj.

The undermentioned Capts. to be Majs.: J. C. Preston (Prov.), B. J. Daunt, A. J. Bado (Prov.), and H. M. Alexander (Prov.).

Capt. L. Game, late R.A.M.C., to be Temp. Capt., and temporarily relinquishes the rank of Capt.

Lt. (on prob.) J. C. Gilroy resigns his commn.

Capt. J. V. McNally to be Maj. (Prov.).

The appt. of Lt. G. T. L. Archer is antedated to Jan. 26th, 1927, but not to carry pay and allowances prior to Jan. 26th, 1928.

Temp. Lt. R. Willan relinquishes his commn.

ARMY DENTAL CORPS.

Capt. R. J. Condie to be Maj.

ARMY RESERVE OF OFFICERS.

Lt.-Col. A. L. Scott, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

General List.—Lt.-Col. P. J. Gaffikin to be Bt. Col.

Capt. G. M. Brown, having attained the age limit, relinquishes his commn. and retains his rank.

J. B. S. Guy and H. J. Curran to be Lts.

Col. C. I. Ellis, having attained the limit, retires and retains his rank with permission to wear the prescribed uniform.

INDIAN MEDICAL SERVICE.

Lt.-Col. H. Innes retires.

Correspondence.

"Audi alteram partem."

THE CLASSIFICATION AND DISPOSAL OF MENTAL PATIENTS.

To the Editor of THE LANCET.

SIR,—In the first leading article in your issue of August 18th you dealt comprehensively with matters debated at Cardiff under the heading of the Early Treatment of the Psychoses and Psychoneuroses, and referred to some of the difficulties with which the subject bristles, reminding us that other powers—Parliament or the public—may cast our deliberations to the winds. It appears to me that controversy, medical and other, hitherto friendly, gathers about one main question: the classification and disposal of patients. Until now, for purposes of disposal, patients, other than the criminal, insane and mental deficients, have been classified as follows:—

1. Certifiable (whether or not actually under certificates).
2. Non-certifiable.
3. Boarders "desirous of voluntarily submitting to treatment" (Lunacy Act, 1890, S. 229), who are individuals permitted to live in Licensed Houses and Registered Hospitals for periods varying from the matter of a few days only to a continuous number of years—e.g., 20 or more. Apparently they have no status; although "submitting to treatment," they are not described as patients, and although living "en pension" they are not treated as "paying guests." The designation of boarder may have been a happy inspiration arising out of the colloquial term "border-line case." It is about this ill-defined class that a considerable amount of abuse has clustered and out of which many of the complaints in connexion with the present system of classification and disposal have arisen.

It is obvious that Classes 1 and 2 above account for the whole community, except the individual in Class 3 who has no status. The general practitioner is well acquainted with the medico-legal distinction between Classes 1 and 2, and no one has any power to consign the non-certifiable section of the community to asylums.

The new classification suggested by the Royal Commission (Report, Part III.—III., IV., V., VI., pp. 157–160) I understand to be as follows:—

The voluntary certifiable patient.
The involuntary ” ”
The voluntary non-certifiable patient.
The involuntary ” ”

This suggested fourfold classification is but a variation of the present one, and, like it, accounts for the whole community, but when it comes to the question of disposal the Commission makes the alarming suggestion that power should be acquired to consign all four of these classes, that is, the whole community, certifiable and non-certifiable, to mental hospitals, that is, asylums. And in order to render its alarming recommendation more workable, the Commission considers it advisable to create a new Order and adopt new procedures, whilst incidentally it seeks to vary the present basis or "definition" of legal insanity. Certification, it suggests, should rest on the ability of an individual A (not being a minor) to write a letter, which in effect would mean, in many cases, the ability of B by means of suggestion, pressure, hypnotism, or threats, to get A to write a letter.

The British Medical Association[1] would vary the present basis for certification but not as the Royal Commission would do so, and whilst suggesting a classification differing somewhat from that of the Commission the Association agrees with its recommendation that powers should be sought for consigning not only the certifiable but also the non-certifiable sections of the community to asylums. I would ask the question: "Whence have we come and whither are we tending?" Is the answer above a reductio ad absurdum or not?

As I pointed out in the discussion at Cardiff on July 27th, to send non-certifiable patients to mental hospitals is not justifiable since it would stigmatise them and their relatives unnecessarily. Since then three cases referred to me by relatives within a week have confirmed my opinion, had it needed confirming, that if the views of the nearest relatives go unheeded we must expect more complaints than there have been in the past. I suggest that the following are the real problems we have to face in relation to legislation:—

1. Can we do away entirely with certification? If not, apart from alterations in the wording of certificates, do we wish to alter the present basis or "definition" for certification, and, if so, can we suggest one more scientific or reasonable than the present medico-legal one? In my opinion those hitherto suggested certainly are not.

2. Do we, for purposes of disposal, wish to recognise a class intermediate between certifiable and non-certifiable, and is there need of establishments where such patients can be sent?

I am, Sir, yours faithfully,
C. A. MORTLOCK-BROWN.

Braunton, N. Devon, August 31st, 1928.

THE LATER RESULTS OF PARTIAL GASTRECTOMY FOR GASTRIC AND DUODENAL ULCER.

To the Editor of THE LANCET.

SIR,—The letters of Dr. A. F. Hurst and Mr. E. R. Flint reveal a difference of opinion upon the value of gastro-enterostomy in the treatment of duodenal ulcer which is a reproach to medicine, and at the same time illustrate the existence of great difficulties and perplexities which beset the investigator of what on the surface would seem to be a very simple issue. Why should two acute observers come to such diametrically opposed views? Obviously because it is usually well-nigh impossible actually, and certainly impossible socially, to perform crucial experiments in medicine in the sense that the physicist does in his own branch of knowledge. For such an experiment there should be one variant only, but in medicine the uncontrollable factors are numerous and some of the significant factors often unknown.

When Dr. Hurst states that gastro-enterostomy is the commonest cause of gastric disorder to-day,

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[1] Supp. Brit. Med. Jour., April 28th, 1928, p. 170.

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Miller, Richard, M.B., 1884(I).
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Mills, Henry W., L.R.C.P., 1895(E).
Milne, John, M.B., 1922(S).
Minnes, Robert S., M.R.C.S., 1896(E).
Moffatt, Douglas M., *M.C.*, M.B., 1909(I).
Moir, Kenneth T., M.B., 1925(S).
Moir, Leonard J., M.B., *1913(S).*
Molloy, William J., M.B., 1892(I).
Monaghan, Patrick J., M.R.C.S., 1911(E).
Monckton, Henry H., L.S.A., 1898(E).
Montgomery, William A., L.S.A., 1896(E).
Moody, *Cyrus M., L.M.S.S.A., 1925(E).*
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Moore, Alfred, M.B., 1892(I).
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Morgan, John F. H., M.R.C.S., *1909(E).*
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Morison, Frederick W., M.R.C.S., 1886(E)
Morris, Edward W., M.R.C.S., 1887(E).
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Moss, Arthur J., L.S.A., 1888(E).
Mosse, Cotton G. T., M.R.C.S., 1915(E).
Mulhern, Annie, M.B., 1924(I).
Mulholland, *Daniel J.*, M.B., *1903(E).*
Muller, Hilgard, M.B., 1920(1).
Mulligan, Bernard J., L.R.C.P., 1922(I).
Murnane, John T., M.B., 1913(I).
Murphy, James C., L.R.C.P., 1924(I).
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Murphy, William P., L.Med.L.S., 1900(I),
Murray, Charles F. K., *O.B.E.*, L.R.C.S., 1869(I).
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Mutis, Aurelio, L.R.C.P., 1893(E).

Nadicarianda, Carriappa A., M.R.C.S., 1924(I).
Naz, Jean B. C. O., M.R.C.S., 1899(E).
Neal, Frederick A., M.B., 1886(S).
Nel, John A., L.R.C.P.S., 1922(S).
Neville, Thomas, M.D., 1874(E).
Newman, William P., M.R.C.S., *1921(E).*
Nichol, Robert, M.B., 1892(S).
Nichols, Frederick P., M.R.C.S., 1881(E).
Nicolls, Cecil G. J., M.B., 1924(I).
Noad, Ernest, M.R.C.S., 1885(E).
Noble, Mary A., M.B., *1915(S).*
Nolan, Ernest D., L.R.C.P., 1925(I).
Norman, Doris B., M.B., 1920(E).

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O'Flynn, *Jerome*, M.B., 1913(I).
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O'Grady, Patrick J., M.B., 1924(I).
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O'Malley, David J., M.D., *1882(E).*
O'Meara, John F. C., M.B., 1915(E).
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Oram, Arthur M., M.B., 1880(E).
O'Reilly, Francis J., L.R.C.P., 1868(I).
Orfeur, Charles H., M.R.C.S., 1868(E).
Orisadipe, *Obasa of Ikija (Prince)*, M.R.C.S., 1891(E).
Orrin, Herbert C., *O.B.E.*, L.R.C.P.S., 1907(S).
Osborne, Thomas, L.R.C.P., 1926(I).
O'Sullivan, *David*, L.R.C.P., *1909(I).*
Owen, Allan C., M.B., 1903(S).
Owens, Edward M., M.R.C.S., 1868(E).

Parker, Charles, M.B., 1892(S).
Paton, George A., L.A.H., *1887(I).*
Pierpoint, Harry W., M.R.C.S., 1902(E).
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Pope, Henry B., M.B., 1881(I).
Power, Patrick W., L.R.C.P., 1902(I).
Prentice, Thomas, M.B., *1923(S).*
Price, William, M.D., 1868(I).

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Ross, Alexander F., M.B., 1915(S).
Rowe, John M., *M.C.*, M.B., 1912(I).
Russell, Elizabeth D., M.R.C.S., 1918(E).

Sanders, Ernest L., M.B., 1921(S).
Savage, John J., M.R.C.S., 1917(E).
Servante, Stewart Q., M.R.C.S., 1925(E).
Sharman, Edward W., L.R.C.P.S., 1891(S).
Shaw, George I., M.B., 1924(S).
Stuart, Christina, M.B., 1922(S).
Sturges, Frank, L.S.A., 1883(E).
Supramanian, Vytilingam, L.M.S., 1919 (Col).
Swinton, Lt.-Col. Francis E., *C.I.E.*, M.R.C.S., 1891(E).

Twells, Charles H., L.R.C.P., 1904(I).

Watt, Thomas M., M.B., 1908(S).
Webster, Percy S., M.R.C.S., 1886(E).
Whyte, Frederick H., M.B., 1923(I).

MEDICINE AND THE LAW.

THE LAW OF INCEST.

On a charge of incest, brought against an uncle and his niece by marriage, the accused were found guilty in the Glasgow High Court on August 28th after some debate regarding the degrees of relationship within which marriage is illegal. Though ancient history contains hints that in certain royal dynasties the marriage of brother and sister was not unknown, society has placed its taboo upon in-breeding, and the laws of England and Scotland reflect the specific inhibitions of the Old Testament. A Scots Act of 1567 declares incest to be a high crime and offence (a phrase which is equivalent to a "felony" in English law) and defines it by allusion to Chapter 18 of Leviticus—an early example of legislation by reference. When Parliament permitted a man to marry his deceased wife's sister (in 1907) and his deceased brother's widow (in 1921), Scots law must have ceased to regard these particular unions as criminal. In the recent case at Glasgow the uncle and niece, by marriage, had apparently been unaware that they stood within the prohibited degrees. As the prosecution observed, if public sentiment no longer sees objection to the matrimonial relationship of an uncle with his niece by marriage, Parliament will no doubt alter the law.

The same ignorance of the offence of incest has been freely noticed in England. Originally the offence —i.e., of sexual intercourse between persons within the prohibited degrees of affinity or consanguinity as annexed to the Book of Common Prayer—was a matter for the ecclesiastical courts only; it was there punishable by excommunication and penance. In the case of criminal assault the ordinary courts might take note of the fact that the assault had been incestuous in character and might on that account increase the punishment within the court's discretion; but the ordinary criminal courts had no jurisdiction to try incest as such until it was made a misdemeanour in 1908. The 1908 Act, which applied to England and Ireland, concerned the relations of a man with his grand-daughter, daughter, sister, or mother. The natural hesitation to give publicity to the evidence in trials of this nature resulted in the insertion of a clause providing that all proceedings under the Act should be held in camera. But this restriction was found to be ill-considered, as might also probably be said of the restrictions regarding divorce court reports under the 1926 Act. Lord Darling and other judges recorded their experience at assizes and declared that the secrecy led to widespread popular ignorance of the law. Eventually, in 1922, the clause was, as respects England, repealed. Prosecutions are rare; the cases, when they occur, usually seem to be due to inadequate housing and a drunken father. So far as concerns the marriage of persons within the degrees at present prohibited, it will be remembered that a Bill specially dealing with the case of uncles and nieces by marriage was narrowly defeated last session, mainly on the appeal of the veteran Archbishop of Canterbury, who was making his final official utterance in the House of Lords. Ecclesiastical opinion is against any relaxation of existing limits; what does medical opinion say?

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. R. W. Mussen to be Surg. Lt.-Comdr.

J. G. Paley as Surg. Lt. *for short service*, and apptd. to *Victory* for Haslar Hospl.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lt. H. G. Ungley to be Surg. Lt.

H. A. M. Whitby entered as Proby. Surg. Lt., and attached to List 2 of the London Division.

Proby. Surg. Sub-Lt. J. M. Ridyard to *Victory*, for R.N. Hospl., Haslar, for training.

ROYAL ARMY MEDICAL CORPS.

Col. O. I. Stockwell is granted the temp. rank of Brigadier whilst Comdt., Sen. Offrs. Sch., India.

Col. N. J. C. Rutherford, late R.A.M.C., is placed on half-pay under the provisions of Arts. 139 and 486, Royal Warrant for Pay and Promotion, 1926.

Lt.-Col. B. B. Burke, *from* the R.A.M.C., to be Col., vice Col. N. J. C. Rutherford.

Maj. J. S. Wallace to be Lt.-Col., vice Lt.-*Col.* B. B. Burke, promoted.

and Mr. Flint that only 10 per cent. ill-results follow the operation, they are both giving a true account of their own experiences, but they are certainly not talking about comparable things. To maintain as much would be nothing less than an intellectual affront to the reader. The controversy over the merits of medicine and surgery in the treatment of gastro-duodenal ulceration has proceeded in this fashion for far too long a period, and, difficult as the subject is, I am convinced it is possible to arrive much more nearly at the essentials of the matter. Collected statistics always suffer from a difference of outlook of the several observers who have, as a rule, dealt with material selected in different ways. There is a common language but no identity of concepts denoted by its terms. For deductions made from massed statistics of very specialised physicians and surgeons should be substituted the judgments of men who have adequate experience of the several methods under investigation.

In the Surgical Unit at St. Mary's Hospital an attempt to evaluate the different surgical methods used in the treatment of ulcer has been made, and my close association with Prof. F. S. Langmead, of the Medical Unit, where a like work on medical methods is being carried out, has enabled me in some way to settle that larger question as to when surgery should be considered at all. I have been criticised adversely for advocating partial duodenectomy for duodenal ulcer in suitable cases, but not one of my critics seems to have treated parallel series of cases, the one with gastro-enterostomy, the other by partial duodenectomy. The time is not ripe yet to make dogmatic statements upon such a question, but I can say that amongst the patients coming under my care the results I get with the larger operation are better than those with gastro-enterostomy. From the section in my book on the dangers of injury to the bile-duct, Mr. Flint has got an impression that I did not mean to convey. I have once only injured the bile-duct in 63 duodenectomies, and the victim is happily well some years after the accident. The danger of the operation can be fairly accurately assessed. Amongst my duodenectomies there have been two deaths, both from lung complications.

Finally, may I state my beliefs about the treatment of gastric ulcer? Surgery is an evanescent phenomenon in the treatment of this disease. Almost certainly the future will provide a method of treatment which will avoid the physiological disturbance which surgery entails and which is so distasteful to the thoughtful surgeon. A very large proportion of cases, even now, are amenable to medical treatment. But there is a residue which only surgery can help, and amongst these a very large majority is restored to health.—I am, Sir, yours faithfully,

CHARLES A. PANNETT.

Pensford-avenue, Kew, August 31st, 1928.

LICENSING IN MIDWIFERY.

To the Editor of THE LANCET.

SIR,—In his "History of British Midwifery," p. 7, Dr. Herbert Spencer thinks it remarkable that, in spite of the clause in the Act 32 Henry VIII., cap. 40, which gave to Fellows of the College of Physicians the right to practise physic "in all and every its members and parts," Dr. Peter Chamberlen, the third, a Fellow of the College, should have been required to obtain a licence to practise midwifery. But that midwifery was not considered by the College to be included in physic is clear from the fact that his father, a barber-surgeon, had been brought before the College, not for practising midwifery, but for prescribing physic, and was warned not to practise medicine. The licence for midwifery was at that time granted by the Bishop of London; it was not until 1783 that the College of Physicians took cognisance of practitioners in midwifery, and instituted a distinct order of Licentiates in Midwifery; the grant of these and other special licences, long previously practised, was abandoned by the College in 1800.

Dr. Peter Chamberlen, the third, although he was a Fellow of the College, had not obtained the Bishop's licence to practise midwifery, and on the petition to the King, of the midwives over whom Chamberlen had endeavoured to assert his self-constituted authority, the inquiry was handed over, not to the College, but to the Archbishop, who, by virtue of the Act 3 Henry VIII., cap. 11, exercised the episcopal authority, and ordered Chamberlen to apply to the Bishop of London for a licence to practise midwifery.

I am, Sir, yours faithfully,

GEORGE C. PEACHEY.

Randolph-crescent, W., Sept. 2nd, 1928.

TOTAL DEATH-RATES, NORTH AND SOUTH.

To the Editor of THE LANCET.

SIR,—I have observed with interest, on p. 470 of your last issue, a paragraph drawing attention to the differences between the total death-rates of the North and South of England. Some 20 years ago[1] I discussed the percentage of the total population which survived to 75 and over, in every registration district of England and Wales, and showed the astonishing differences which existed, as deduced from the Registrar-General's decennial report for 1891 to 1900. Thus, whereas in the Devonshire district of South Molton 27·5 per cent. reached those ages, in the district of Manchester only 2·2 per cent. did so. It at once became apparent that the largest survivals were in country districts and the smallest in towns. I considered the fallacies which might be introduced by (1) infant death-rates, and (2) the movement of population from country to town, and concluded as follows:—

1. That there is a very remarkable disparity of longevity in different districts of England and Wales.
2. That this disparity in closely related to density of population.
3. That mere movement of population from country to town, whilst probably tending to make the disparity appear greater than it really is, has on the other hand probably no very considerable effect upon the figures.

I would point out that the differences were by no means a matter of "north" or "south," since some of the worst districts in respect of longevity were in London, and some of the best were in Yorkshire. Social conditions seem the most likely chief cause of the disparities.—I am, Sir, yours faithfully,

Exeter, Sept. 1st, 1928. W. GORDON.

NEW SOLVENTS FOR SKIN ANTISEPSIS.

To the Editor of THE LANCET.

SIR,—In your last issue (p. 444) Dr. Macdonald and Mr. Peck state that "it is on account of the heavy annual cost to hospitals that we have searched for a solvent that would replace" rectified spirit. But is isopropyl alcohol, the solvent suggested, really cheaper? The answer to this question depends upon the net cost of rectified spirit. The authors state this to be £2 13*s*. after deduction of rebate. I suggest this figure is inaccurate. Actually the cost per gallon after deduction of rebate is 26*s*. Moreover, I fail to find a reference in the paper to "The Grant in Aid in respect of duty paid by voluntary hospitals on spirit used in their dispensaries for medicinal purposes" which is received from the Government through the Ministry of Health. In 1927 this averaged 16*s*. 4*d*. per gallon of rectified spirit at the London Hospital, thus reducing the cost to 9*s*. 8*d*. per gallon. As the authors state that the cost of 70 per cent. isopropyl alcohol would be 10*s*. 6*d*. per gallon, it appears that the promise of a saving of 85 per cent. is a dream. It is not to be expected that the Chancellor of the Exchequer will continue the grant in aid if the use of spirit is abandoned.

I am, Sir, yours faithfully,

F. A. HOCKING,

Sept. 4th, 1928. Pharmaceutist to the London Hospital.

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[1] The Distribution of Longevity in England and Wales. Brit. Med. Jour., 1909, i., 1344.

Obituary.

ALBERT ARTHUR NAPPER, M.R.C.S. ENG., L.S.A. LOND.

WE regret to announce the death of Dr. A. Arthur Napper, which occurred on August 22nd at his residence, Rallywood, Reigate, in the eighty-fourth year of his age. Arthur Napper was born in 1845, the son of Dr. Albert Napper, a practitioner at Cranleigh, and a member of one of the oldest Sussex families, a band of which had migrated in the eighteenth century to Surrey. He received his general education at Epsom College, which was founded in 1855, being the second boy to enter, and proceeded to the medical school of King's College Hospital, where Sir William Fergusson, Dr. Lionel Beale, Sir George Johnson, and Dr. W. A. Guy, the famous toxicologist, were among the prominent members of the staff. He qualified M.R.C.S. Eng. as soon as he had reached the age of 21, served as house-surgeon at the hospital, obtained the L.S.A. three years later, and joined his father in the family practice at Cranleigh. This was a good practice, and the father was a well-known man in public as well as professional life, who took a deep interest in professional problems, writing on the relation of medicine to the public, on village hospitals, and on rural sanitation. Young Napper was soon associated closely with this side of the work, becoming medical officer of health of the district, a post which he continued to hold when his father retired some ten years later. For nearly 50 years Mr. Napper practised at Cranleigh, latterly as senior partner in a large firm, and he only retired in advanced years owing to failing eyesight. His popularity as a doctor was earned by skill and clinical accomplishment, but the wide personal acquaintance which he enjoyed in the district was due also, and largely, to his life-long and ardent devotion to field sports.

His association with his old school was a long and close one. The second boy to enter Epsom College upon its foundation, when he was but 10 years old, his first wife, Elinor Walker, was the sister of Dr. John Walker, who was the first entrant to the school. Napper was at Epsom for six years as a scholar, was for 45 years a governor, and during most of that period a local secretary; he was a member for varying periods of the finance, works, and school committees, and when he retired from the Council, in 1926, was elected a vice-president.

ALAN ADAIR DIGHTON, L.R.C.P. AND S. EDIN.

THE death occurred at his home near Cheltenham, on August 28th, of Dr. Alan Adair Dighton, a well-known general practitioner and sportsman in the neighbourhood, and esteemed equally by all classes represented in the large professional connexions. Alan Adair Dighton was born in 1861, the son of the ev. C. E. Dighton, Vicar of Maisemore, was educated Clifton and St. George's Hospital, and obtained the ottish double diploma in 1884. After qualification took a post as resident surgeon at the Cheltenham Branch Dispensary, and from that date for the next 35 years he practised in that city both as medical officer to various friendly societies and among a large clientele of private patients. For his repute as an obstetrician was high, while many of his male patients were his personal friends and associated with him in his full life as sportsman and especially cricketer. He was deeply interested, also, in the local affairs of Cheltenham, was a town councillor, and a prominent political worker in the Conservative cause. After the war he left Cheltenham for Ross, where he practised for a short time until failing health led to his retirement, but he retained his keen interest in sport, and was one of the founders of the Ross Race Meeting.

FRANCIS EDWARD ATKINSON, M.R.C.S. ENG.

Dr. F. E. Atkinson, who died on Sept. 2nd at Ilkley, had been for nearly half a century medical officer to the combined sanitary authorities of the upland district in the West Riding of Yorkshire known as Craven. He studied medicine at the Yorkshire College, Leeds, where he was Thorp scholar in forensic medicine and hygiene, completing his course at University College, London, from which he took his M.R.C.S. in 1874 and L.R.C.P. in the following year. After holding resident appointments at Leeds General Infirmary and the Bradford Infirmary, he went to live at Settle as medical officer to the Skipton and Sedbergh rural districts, and began to issue the series of annual reports which are the chief monument to his industry and accuracy. In 1884 he traced an epidemic of dysenteric diarrhœa to contaminated water-supply, and 15 years later made a comprehensive survey of typhoid fever at Kildwick. Dr. Atkinson was senior member and a past president of the Yorkshire branch of the Society of Medical Officers of Health, and at the time of his death the oldest medical officer in the North of England.

JAMES ERNEST MOORHOUSE, M.D., C.M.EDIN., B.SC. ST. AND.

THE death occurred on August 17th in Stirling of Dr. J. E. Moorhouse, a well-known practitioner in the town. Born in Yorkshire in 1870, Dr. Moorhouse went to live in Scotland as a boy, and it was at the University of St. Andrews that he took a science degree in 1889, proceeding to Edinburgh to study medicine. He qualified M.B., B.S. in 1892, and held a resident post at the Royal Maternity and Simpson Memorial Hospital, Edinburgh. In 1893 he set up practice in Stirling, where he was appointed surgeon to the Stirling Royal Infirmary, returning to Edinburgh to take his M.D. in 1895. Dr. Moorhouse became popular, and his work increased so rapidly that it soon became necessary to take a partner. He held the posts of medical officer to the Argyll and Sutherland Highlanders' depôt at Stirling Castle and to Stirling Combination Poorhouse. During the war he was attached to the R.A.M.C., taking charge of the wounded in the local military hospital, and since has acted as referee for the Ministry of Pensions. Of recent years professional activities left Dr. Moorhouse little leisure for games, but he was at one time a keen golfer and a skilful chess player. His attractive personality brought him many friends in Stirling, and he will be remembered with deep regret by his patients and colleagues in the town.

UNIVERSITY OF EDINBURGH ANIMAL-BREEDI RESEARCH.—A new building, to cost £30,000, is to erected to extend the animal-breeding research departmen of which Prof. A. E. Crew is the director. Towards the cos of the building and its equipment and the endowment o the chair, the University has received the following contributions: £20,000 from the International Education Board, New York; £16,000 and an annual grant from the Development Commission; £10,000 from Lord Woolavington; and £10,000 from the Empire Marketing Board.

CHARING CROSS HOSPITAL.—The annual report is one of the most satisfactory that has ever been presented. Charing Cross has a lower cost per bed than any metropolitan hospital; the average stay of the 4118 in-patients was 21 days, and the average cost £11 10*s.* 3*d.* There were 25,596 new out-patients, whose average cost was 8*s.* 1*d.* The income of £59,000 (expenses £55,000) included £12,000 paid by patients.

CONTRIBUTORY SCHEME AT FALMOUTH HOSPITAL.—It has been agreed between the governing body and the medical staff that all those contributors to the weekly scheme whose income does not exceed £200 a year shall receive free medical and surgical treatment for themselves and their dependants. Where the income exceeds that amount patients are to make their own arrangements with their medical attendants. Last year out of 4947 "bed-days" 3103 were allocated to members of the contributory scheme.

Medical News.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN.—The following scholarships have been awarded during the session 1927–28:—

St. Dunstan's Medical Exhibition: Miss M. Louden (St. Paul's Girls' School). Isabel Thorne Scholarship: Miss M. Mayeur (St. Paul's Girls' School). Sir Owen Roberts Memorial Scholarship: Miss M. Tate (Retford High School, Notts). Mabel Sharman Crawford Scholarship and Lieutenant Edmund Lewis (R.A.F.) and Lieut. Alan Lewis (R.N.A.S.) Memorial Scholarship: Miss B. F. Goldsmith (L.S.M.W.). School Jubilee Bursary: Miss N. I. Faux (L.S.M.W.). Alfred Langton Scholarship: Miss D. Woodman, M.Sc. (L.S.M.W.). Ellen Walker Bursary: Miss H. B. Burt (L.S.M.W.). Flora Murray Bursary: Miss M. N. Lunn and Miss E. M. Newham (divided). Dr. Edith Pechey Phipson Post-Graduate Scholarship: Dr. Annie Price.

METROPOLITAN ASYLUMS BOARD.—At a meeting of the Board held on Sept. 1st it was announced that the Board of Control had accepted in principle the view that the mental hospitals under the direction of the M.A.B. should henceforward be reserved to meet the needs of London itself. Arrangements will be made for the gradual removal of cases from other counties, so that in any event none of them will be retained after September, 1930.

KING'S COLLEGE HOSPITAL.—The annual dinner of past and present students will be held at 7.30 P.M. at the Trocadero Restaurant, Piccadilly-circus, London, W. 1, on Oct. 3rd. Dr. B. R. Turner will be in the chair. The dinner secretaries are Dr. Ernest Playfair and Dr. H. A. Richards.

GIFTS TO UNIVERSITIES.—Lord Haldane made the following public bequests, all free of Government duties: University of Edinburgh, £1000; University of Bristol, £2000; Birkbeck College, London, £1000; University of Göttingen, £1000; British Institute of Adult Education, £200.

SOCIETY FOR THE STUDY OF INEBRIETY.—A meeting will be held in the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W., on Oct. 9th, 1928, at 4 P.M., when Dr. Hubert J. Norman will open a discussion on "Alcohol and Drug Addiction in Relation to Mental Disorders."

ASSOCIATION OF SPECIAL LIBRARIES AND INFORMATION BUREAUX.—The fifth annual conference will be held at New College, Oxford, from Sept. 14th–17th. Among the subjects to be discussed are Existing Types of Indexes to Technical Periodicals, the Librarian as Archivist, Vocational Selection and Guidance, Scientific Abstracts, Information on Accident Prevention, and the Necessity for the Standardisation of Bibliographical Methods.

THE LATE DR. F. P. HUGHES.—Frank Percival Hughes, who died at Bristol following operation on August 23rd, was a Guy's man, who qualified in 1904, taking his London degrees in 1907. He held a series of house appointments at Guy's Hospital, and, deciding to specialise in mental disease, he obtained resident posts at Bethlem Royal Hospital, and then at the Three Counties Asylum. Later he settled at Pinner, where he acted as assistant bacteriologist to the Government lymph establishment at Hendon.

PHARMACOLOGICAL CONGRESS AT HAMBURG.—The eighth annual session of the German Pharmacological Society takes place at Hamburg from Sept. 12th to 15th in the Pharmacological Institute at the Hospital St. Georg. After formal meetings on Wednesday evening, Thursday is given up entirely to a series of papers on the heart and great vessels in honour of William Harvey, Dr. G. V. Anrep (Cambridge) having accepted an invitation to lecture on new investigations into the physiology and pharmacology of the coronary vessels. Other major communications will be made by Prof. G. Liljestrand (Stockholm), A. Jarisch (Innsbruck), H. Straub (Göttingen), and H. Eppinger (Freiburg i/Br.). On Friday the subject of modern industrial poisoning will be introduced by Prof. F. Flury (Würzburg) and H. Zangger (Zürich). On Saturday Prof. G. Barger (Edinburgh) will give an address entitled Old and New about Ergot, to be followed by A. Stoll (Basle). More than 40 separate papers will be read on a wide range of subjects. Excursions will be made in common with other sections of the 90th Congress of the Society of German Naturalists and Doctors which is meeting at the same time. The director of the Congress is Prof. Hermann Wieland, of Heidelberg.

ST. GEORGE'S HOSPITAL.—The annual report for 1927 lays stress upon the great increase in the cost of maintenance which, at £83,000, was more than double that of 1913, and more than £5000 in excess of the income. Unless at least £20,000 a year of additional income is obtained it may be necessary greatly to curtail the hospital's activities. Last year 5364 in-patients were treated at a cost of £13 12*s.* 4*d.* each for an average stay of nearly 22 days. New out-patients numbered nearly 37,000 and cost 7*s.* each.

THE LATE DR. J. H. WISEMAN.—James Harry Wiseman, who died at Sheffield on August 23rd, took his medical studies at Sheffield University and London Hospital, qualifying M.R.C.S. in 1917, and straighway entering the R.A.M.C. Special Reserve. He was in partnership with his father, Dr. Charles Wiseman, and well known in the Crookes and Walkley districts of Sheffield.

ABERDEEN INFIRMARY.—On August 28th the Prince of Wales laid the foundation-stone of the new Royal Infirmary. The buildings will cost £400,000, of which over £340,000 has been collected in rather less than 18 months. On the new site, some two miles from the centre of the city, will eventually be massed the Royal Infirmary itself, the Aberdeen Sick Children's Hospital, the Maternity Hospital, the Public Health Department, and the University Medical School. The Infirmary will consist of five wings holding 500 beds, and there will be a large nurses' home. The adjacent Burnside Home for Mothers is to be enlarged from 56 to 150 beds, while the Maternity Hospital will have 70 beds.

THE LATE DR. O. W. B. BROWNING.—Dr. Browning, whose career has been cut short at the age of 27 years, was a son of the late Dr. Samuel Browning, of Birmingham, and a nephew of Dr. J. O. W. Barratt. He qualified from University College Hospital in 1925, and was a steady worker who was regarded by his teachers as likely to attain distinction. Encephalitis lethargica attacked him while studying for the London M.B. examination, and after considerable improvement had given hope of his resuming an active existence, death occurred unexpectedly nearly three years after the initial attack.

A CANADIAN MEDICAL TOUR.—Some 40 members of the Canadian Tuberculosis Association, accompanied by their President, Dr. J. H. Elliott, and Executive Secretary, Dr. R. E. Wodehouse, reached Liverpool last Sunday for a study of tuberculosis and its methods of prevention and treatment as practised in this country and on the continent. After a visit to Liverpool Cathedral they went on by road to Birmingham where they received a civic welcome and visited the Yardley-road and Romsley Hill Sanatoria and some of the garden extensions. Their next objectives were Cardiff, under the ægis of the Welsh National Memorial Association, and Alton Park, Hants, where Sir Henry Gauvain was to show them the pioneer institution for surgical tubercle. On Oct. 16th the party will be entertained in London by their colleagues of the British National Association for the Prevention of Tuberculosis, and the return home will be made from Glasgow on Oct. 27th by the White Star liner *Calgaric.*

Corrigendum.—In some copies of THE LANCET issued last week a misprint occurred in the brief account of the First International Congress of Oto-Rhino-Laryngology held at Copenhagen. The opinion of Dr. A. Pohlman, speaking on "minimal audition," that lengthened bone conduction is apparently not real, was actually *opposed* by clinical observers of the German school present at the Congress.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W. 1.
TUESDAY, Sept. 11th, and SATURDAY, Sept. 15th.—BETHLEM ROYAL HOSPITAL, St. George's Fields, S.E. Post-graduate Course in Psychological Medicine.

ROYAL NORTHERN HOSPITAL, HOLLOWAY-ROAD, N.
TUESDAY, Sept. 11th.—3.15 P.M., Mr. A. M. Zamora: Antral Infections.

Notes, Comments, and Abstracts.

INSTITUTES OF LEGAL MEDICINE.

IN THE LANCET of July 26th we commented on the need for the establishment of a medico-legal institute in London. A detailed study of the duties, functions, and responsibilities of such institutes in other countries shows that in some of them the centre of medico-legal education is also an integral part of the machinery of justice, assisting it at all points; in some it is merely a department of the biological or pathological section of a university, administered as a minor part of the activities of the professors of those subjects and housed in odd corners and unwanted rooms. The object of this article is to indicate the position that medico-legal nstitutes occupy in various civilised countries and the ontribution they make to the national life. The information drawn from the ninth series of the invaluable Rockefeller rochures on Methods and Problems of Medical Education, hich contains nearly thirty articles describing as many edico-legal foundations throughout the world.

Their Origin and Functions.

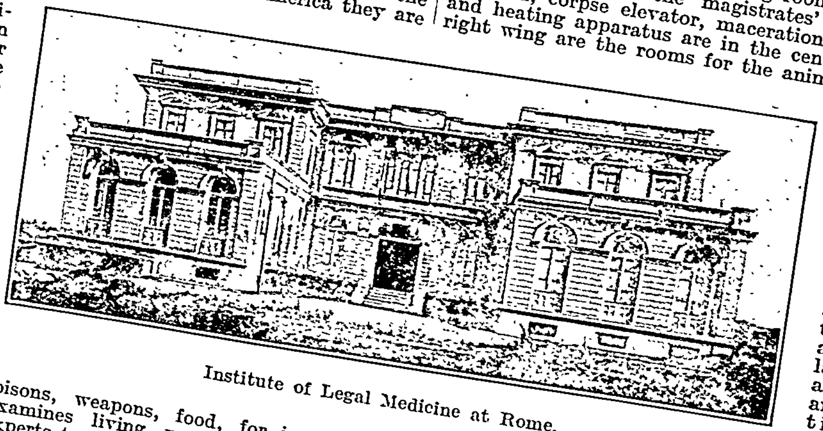
As a general rule, medico-legal institutes originate either annexes to the public morgue or as departments of the hological section of a university. In America they are lly an accre- round the e of the medi- xaminer, an al peculiar, or almost so, to the New World, who is responsible for the investigation of all suspicious deaths. The functions of a medico-legal institute are extremely wide, for. in addition to the post-mortem work which forms so large a part of its obligations, it investigates specimens of all kinds—human delicta, poisons, weapons, food, for instance—for the police, examines living persons for injury or disease, provides experts to assist courts of law, studies the psychology of criminals and others, builds museums of specimens and photographs, and teaches legal medicine to medical graduates and undergraduates, lawyers, and public officers. The head of the institute is often, as in America, a public officer himself, and, as in many countries, professor of forensic medicine at the local university. Since the scope of the work includes every branch of medicine, from anatomy and physiology to biochemistry and psychiatry, it is obvious that a medico-legal expert must be extremely versatile. In addition to all these routine duties the staff must, if it is to maintain a live and creative institution, devote itself to research and the recording of its results in papers and books.

It is strange that by far the most highly evolved medico-legal system in existence should be that of a relatively uncivilised country—Egypt. The vital need for protection against as large and as ruthless a criminal population as any in the world, together with the genius of one or two Englishmen, has made the Medico-Legal Institute in Cairo an essential part of the organisation for the investigation of crime. It is made use of daily, quite apart from medical or chemical considerations, and practically no case of importance occurs in which it is not consulted. All cases of sudden death, accident, sexual assault, and serious injury occurring in Cairo are examined at the mortuary or head office, and all cases of poisoning throughout the country, all specimens for examination, all claims for compensation after injury, permanent infirmities, and appeals against the decision of other medical officers are referred to the Institute. Experts are sent to the provinces on demand, but the Institute is in touch with the provincial medical officers of the Department of Public Health, who are consulted in all minor cases of crime. Few persons in Egypt know their own age, and the Institute has to apply special methods, including X ray examination of the epiphyses, for estimating the age of young offenders, girls who have been the victims of rape, prostitutes who apply for licence, and others. Its technique for identifying bullets and cartridge-cases is exceptionally fine. The principal medico-legal expert is also the professor of legal medicine in the University; the course of instruction takes six months, and the examinations form part of the final test for medical qualification. The standard is higher than in most European countries, as a great part of the work of a provincial general practitioner is medico-legal. The mortuary is situated in the School of Medicine, and daily compulsory demonstrations of cases of accident, murder, and suicide are given.

Medico-Legal Institutes of Europe.

Europe is well provided with medico-legal institutes. Vienna had a chair of legal medicine in 1804, and Hungary, which boasts of being a nation of lawyers, claims that its universities have taught legal medicine as a compulsory subject for several centuries. Not only the capitals, but other large towns as well in Austria, Hungary, Poland. and Roumania have medico-legal institutes housed in separate buildings with the most modern equipment, and engaged in active coöperation with the forces of law.

Italy is making great strides towards the realisation of the most modern medico-legal ideas, and the new Institute at the Royal University of Rome, which is almost the last word in convenience and completeness, might serve as a model for all such foundations. The public morgue is in the basement of the building; the left wing contains refrigerator cells, identification and dressing rooms, rooms for autopsy, photography, and the magistrates' investigation. The museum, corpse elevator, maceration room, service room, and heating apparatus are in the centre block, and in the right wing are the rooms for the animals' and their custodians' quarters, animal autopsy, and experimental laboratory. On the ground level are two large lecture rooms, each served by an elevator, one fitted for microscopic demonstration, and one for autopsy; a chemical and microscopical laboratory, examination rooms, and accommodation for the medical staff and visitors. On the first floor are laboratories for psychology and chemistry, bacteriology, and histology; anthropology rooms, a library, the director's room, and the professor's own laboratory.



Institute of Legal Medicine at Rome.

Many quite small countries have large up-to-date institutes. That at Lisbon, which is just nearing completion, rivals all but the finest European ones; Roumania has an autonomous institute conducted on original lines by the versatile Prof. Mina Minovici, and Cuba is building one with first-class equipment combined with a morgue. Havana is the world's paradise of medical jurists, for the judiciary system includes a corps of 20 doctors of legal medicine who attend all courts and give evidence on all matters in which medical knowledge is material, who examine all persons who have met with violence, perform all legal autopsies, and visit wounded men every five days to inspect their condition and treatment. In 95 per cent. of trials, according to Drs. Raimundo de Castro and Antonio Barreras, the judgment goes according to the medical evidence.

The Position in England.

This excellent collection of the Rockefeller Foundation shows that the medico-legal institute is a feature of most civilised States, even the smallest, and that this country is in this respect seriously behind its neighbours. We have the best judicial system in the world, and allow practically no place in it to medicine. Glasgow and Edinburgh, thanks to the Scottish legal system, have departments of forensic medicine of which the directors are also "casualty surgeons" of the city, and to that extent in touch with the administration of law, but in England, where law and medicine stand individually as high as anywhere in the world, there is no recognition of any link between them. Autopsies are done by local police surgeons or by practitioners called in by the coroner; these officers have no specialised training to approach that of their continental colleagues, and their results are, as far as collective usefulness goes, buried with the corpse. The amount of scientific material that goes to waste from our courts for want of a centre in which to collect and use it is depressingly great. A few gifted individuals have acquired great knowledge of the subject, and they expound it to students for a few hours knowing that in all probability no medico-legal questions will be set in the examination. Consequently, the average standard of knowledge of legal medicine among medical men is not as high as it should be. Yet the science of medicine touches the administration of law at many points. If a crime of violence is committed, an examination of wound or weapon often yields indispensable evidence. If human remains are found, the identity of the corpse, the cause of death, and the circumstances surrounding it are often questions only answerable by a medical man. The insurance office calls medical aid to the making of its contracts with its clients; the probate court is often guided by the advice of the alienist in its disposal of disputed wills. The development of legal medicine is thus extremely helpful, if not indispensable, to the administration of justice, and we can think of no better way of promoting it than the establishment in London of a medico-legal institute.

THE PREVENTION OF DROWNING.

FROM a statement just issued by the life-saving service of the American Red Cross we learn that between 6000 and 8000 persons are drowned each year in the United States. Mr. H. F. Enlows, who directs this service, claims that 80 per cent. of these fatalities are preventable. Many drowning accidents, he says, occur within a comparatively short distance of safety, few of them happen in mid-stream or far out from shore. Lives are lost through people losing their heads. If they find themselves out of their depth unexpectedly for the first time, they become so panic-stricken that they are unable to save themselves. Therefore the Red Cross beginner's test arranges for this class of swimmer to jump into water that is over their heads and swim for safety. Having learned to do this under supervision, they are safeguarded against panic. Under the ægis of the American Red Cross more than 168,000 swimmers have already been taught life-saving methods. During June of this year 14 training schools in various part of the country gave a 10-day intensive course in life-saving to nearly 1000 swimmers. Upwards of 5000 examiners and a special corps of 24 travelling instructors are now at work throughout the country. During the summer season special demonstrations are given at hundreds of resorts. During the winter the campaign is carried on at in-door swimming pools, with special attention to those of the universities and colleges.

RATS AND RED SQUILL.

REFERENCE was recently made to the efficacy of red squill in the destruction of rodents without endangering the lives of other animals, and our attention has been drawn to a leaflet issued by the Rural Information Bureau of Sidmouth, in which it is remarked that although Government and municipal authorities obviously cannot recommend anything of a proprietary nature, no matter how efficient such may be, it is an open secret that the ideal form of red squill is available under the registered name of Nomorats. The one-pint tin of this preparation at 7*s.* 6*d.* net is sufficient for about 400 baits, and special rates can be quoted for large consumers. We can testify to its efficacy from actual experience. Nomorats is distributed by Messrs. Abol, Ltd., of Paddock Wood.

Appointments.

SLOAN, ALLEN THOMSON, M.B., Ch.B. Edin., has been appointed Medical Officer of Edinburgh Prison.

Surgeons under the Factory and Workshop Acts: CAITHNESS. H. P., M.D. Edin., D.P.H. (Linlithgow District of the County of West Lothian); AINSCOW, A. E., M.B., Ch.B. Vict. (Melbourne District of the County of Derby).

Manchestsr Royal Infirmary. Resident Appointments: SHEPPARD, R. F., M.B., Ch.B.; LONGWORTH, J. A., M.B., Ch.B.; WILKINSON, J. F., M.B., Ch.B.; HARDMAN, G. B., M.B., Ch.B., House ... M.R.C.S.; OSBORNE, R. P., ... Ch.B.; TICKLE, H., M.I ... Ch.B.; HUGHES, I. M., ... KIE, Miss M., M.B., Ch.B., ... (Central Branch). BEAL, J. R., M.D., Clinical Parhologist. Non-resident Appointments: CLEGG, S. F., M.B., Ch.B., Surgical Registrar (Second). ... M.B., Ch.B.; DAVIES, Miss M. G. ... cal Assistants (Surgical). BODOANO, ... B.: HERBERT, Miss A., M.B., Ch.B.,

Vacancies.

For further information refer to the advertisement columns.

All Saints' Hospital, 49–55, Vauxhall Bridge-road, S.W.—H.S. At rate of £150.

Albert Dock ... ital, Connaught-road, E.—Res. Med. O. At rate of £110.

Ashton-under-Lyne, District Infirmary.—H.S. At rate of £150.

Birmingham City.—Asst. M.O. £750.

Birmingham and Midland Eye Hospital, Church-street.—H.S. £110.

Blackburn Union Institution and Infirmary.—Res. Asst. M.O. £200.

Brighton Education Committee.—Asst. Sch. M.O. £600.

Cheltenham Borough.—M.O.H. and Sch. M.O. £850.

Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall Gt. Barrow.—Assist. M.O. £250.

Connaught Hospital, Walthamstow, E.—Sen. Res. H.S. At rate of £150. Also Jun. Res. H.S. and Res. H.P. Each at rate of £100.

Denbigh (near), North Wales Sanatorium.—Male Asst. Res. M.O. At rate of £200.

Derby, Derbyshire County Council.—Tuberculosis Officer. £750.

Dreadnought Hospital, Greenwich, S.E.—H.P. and H.S. Each at rate of £110.

Exeter, Wonford House.—Deputy Medical Supt.

Gloucester, Gloucestershire Royal Infirmary, &c.—Second H.S. At rate of £100.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. Also H.P. Each at rate of £50. Also Part-Time Jun. Cas. O. At rate of £75.

Ipswich, East Suffolk and Ipswich Hospital.—H.S. £100.

London Lock Hosp., 91, Dean-st., W.—H.S. At rate of £200.

Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Res. M.O. At rate of £125.

Manchester Ear Hospital, Grosvenor-square, All Saints.—Two H.S.'s. At rate of £150 and £120.

... *are Centres.*—M.O. £600.

... *t London, Greenwich-road,* ... H.P. At rate of £125.

... .—Asst. P.

... *rham, College of Medicine.*

... H.S., and two Asst. H.S.'s. Each at rate of £150.

Orkney, Island of North Ronaldshay.—Medical Practitioner. £400.

Patna Medical College.—Prof. of Physiology. Rupees 1200.

Plymouth, Homœopathic and General Hospital.—H.S. At rate of £100.

Portsmouth, St. Mary's Infirmary, Institution, &c.—Second Asst. Res. M.O. Also Third Res. M.O. £300 and £250 respectively.

Queen's Hospital for Children, Hackney-road, E.—H.P. Also Cas. O. Each at rate of £100.

Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.

Richmond, Surrey, Royal Hospital.—Sen. H.S. At rate of £150.

Royal Northern Hospital, Holloway, N.—Res. M.O. £200. Also H.P. and Obstetric H.S. Each at rate of £70.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. £150.

St. Mary's Hospital, W.—Asst. Pathological Chemist. £300.

Salisbury Generc ... 0.

South Shields, ... H.S. £150.

Talgarth, near ... *Sanatorium, &c.*—Asst. Res. M.O. £200.

Truro, Royal Cornwall Infirmary.—H.S. £170.

University of London, S. Kensington, S.W.—William Julius Mickle Fellowship. £200.

West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. Each at rate of £100.

... Res. M.O. £130.

... *and Staffordshire Hospital.*— ... of £100.

... S. At rate of £170.

The C ... ories announces vacant appointments f ... Surgeons at Corris (Merionethshire) a

Births, Marriages, and Deaths.

BIRTHS.

CAIRD.—On August 24th, at Glastonbury, wife of Karl F. Caird, M.B., of a son.

JOHNSTON.—On August 26th, at Forest-road, Birkenhead, to Mary Murray Johnston, M.B., Ch.B., D.P.H. (*née* Jack), wife of F. B. Johnston, M.A., of a son.

LEON.—On August 30th, at Clarence Gate-gardens, the wife of Kenneth Leon, M.R.C.S. Eng., of a daughter.

MAYBURY.—On August 10th, at Siota, Gela, British Solomon Islands, the wife of Lysander Montague Maybury, M.A., M.B., of a son.

DEATHS.

ATKINSON.—On Sept. 2nd, at Ilkley, Francis Edward Atkinson, M.R.C.S., L.R.C.P., of Bowerley, Settle, medical officer of health, Cr ...

BROWNING.—O ...). W. B. Browning, M.R.C.S., ... aged 27 years.

HAWKE.—On August 31st, suddenly, of heart failure, Edward Drummond Hay Hawke, M.R.C.S., of Shortlands, Kent.

MORGAN.—On August 26th, at a nursing home in Newcastle, George Frederic Elliot Morgan, M.R.C.S., of West Hartlepool, aged 64 years.

NEWELL.—On August 30th, at Moville, Co. Donegal, Edwin G. Newell, M.D. Dub.

NICHOLLS.—On Sept. 1st, at a nursing home, Francis John Nicholls, M.B., B.Ch. Camb., of Eastbourne, aged 58 years.

OSLER.—On August 31st, at Norham-gardens, Oxford, Grace Revere Osler, wife of the late Sir William Osler, Bart.

PRITCHARD.—On August 31st, at a nursing home in London, after an operation, Owen Pritchard, M.D. Brux., of Gloucester-square, aged 74 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

An Address

[ABRIDGED]

ON THE

RELATION OF PHYSIOLOGY TO OTHER SCIENCES.

Delivered before the Section of Physiology of the British Association at Glasgow on Sept. 11th

BY PROF. C. LOVATT EVANS, F.R.S.,
PRESIDENT OF THE SECTION.

[AFTER reviewing the close association between physiology and clinical medicine and their mutual debt, Prof. Lovatt Evans deplored the regrettable estrangement between the two subjects which arose in the latter part of last century, when physiologists were concerned with matters such as nerve-muscle physiology, which appeared to be chiefly of academic interest. At the present day it was admitted that the knowledge then gathered has proved of great value in directing physiological inquiry along scientific lines, from which the science of medicine has profited as much as physiology itself. The interesting revival of the study of the same subjects by more accurate methods within the past few years had further enriched our insight into the fundamental phenomena of life and vindicated the opinions of our predecessors as to the value of such investigations. The development of physiological chemistry, largely due to the influence of Prof. W. D. Halliburton, and of such sciences as neurology, histology, embryology, organic chemistry, physical chemistry, experimental physiology, and pharmacology was the great dilemma of the medical curriculum. Prof. Lovatt Evans continued :—]

The solution to the difficulty lies, in my opinion, in two directions : first in the extensive modification of the present system of examinations, and secondly in the exercise of a sympathetic understanding on the part of specialist teachers of the difficulties of the student and a proper perspective of the relation of his own subject to the requirements of the curriculum as a whole.

THE UTILISATION OF PHYSIOLOGICAL METHODS IN CLINICAL MEDICINE.

It is, in my opinion, quite impossible, and perhaps undesirable, at the present time to frame instruction in physiology so as adequately to equip the ordinary medical student to proceed directly to the prosecution of research in any of its branches ; this can only be achieved by a further year or two of study of the subject, such as by a science course for an honours degree. One of the objects of instruction is to enable the latest results of physiological investigation to be utilised in the clinic, and it seems to me that one of the best ways for this to be effected is for some workers specially trained in physiological methods to enter the staff of clinical units where facilities for research work are at hand. The opinion was at one time prevalent among many clinicians that if their problems required the use of methods similar to those of experimental physiology these should be farmed out to a physiologist, and although there are cases where this procedure may be followed with advantage, the rich harvest which has already been reaped by the importation of physiological knowledge and methods into, rather than the export of problems from, the clinic, is adequate justification for the former. It is in any case encouraging to note the present-day decline of the attitude that experimental investigation is work of a lower order, which can be put out like so much washing, for the employment of an inferior caste. We at the present day, however we may be labelled, are not merely willing to admit, but eager to assert, that we cannot recognise fundamentally distinct methods of physiology, of psychology, of medicine, of chemistry, or of physics ; we only admit a method of experimental inquiry common to all science and slightly modified to suit particular cases.

THE APPLICATION OF MATHEMATICS TO PHYSIOLOGICAL PROBLEMS.

[In discussing the scientific aspects of physiology, the lecturer advocated mathematics as one of the collateral subjects of study which might be chosen by the young physiologist, for the following reasons :—]

The qualitative observations of one generation tend to become quantitative at a later stage of development of a science, and the degree of development of a science can indeed to some extent be judged by the extent to which it falls into a scheme of the unity of science by giving results which are capable of mathematical treatment and of expression in broad general principles. Mathematics and mathematical physics have been of considerable use to physiology in increasing the accuracy of its experimental data, and this in two ways. First, by bringing the accurate experimental and intellectual methods of physics to bear on the construction and use of the numerous physical instruments which it employs. It has been said by Prof. A. V. Hill that many of the early investigations on muscle were in reality studies of the properties of levers, and it is certain that similar remarks apply to only too many investigations in which the properties of the apparatus used have not been suitably investigated. As illustrations of the value of mathematical-physical study of apparatus one may mention the classical investigations of Frank on hæmodynamical recording apparatus, the fundamental treatment of string galvanometers and similar instruments by Einthoven, the correction of capillary electrometer records by Keith Lucas, and the vast improvements in galvanometer systems effected by Downing and Hill.

Even when the apparatus at the disposal of the physiologist is unexceptionable, however, it is often the fact that, owing to the nature of the subject, results ar [illegible] epetition with the same ease and [illegible] of chemical or physical experime [illegible] of the results is due in such cases to what are called *accidental circumstances*, a term which in reality means circumstances over which we have no control, owing either to our ignorance of their nature, or else to our inability to alter them. In those cases where further study provides methods of mo [illegible] and therefore more adequatel [illegible] cumstances, valuable results [illegible] For instance, certain of the obscure causes of different behaviour under particular conditions are inborn, and can be controlled by the use of inbred strains of animals such as those of the standard inbred white rats ; or again, one may mention the far-reaching results of the observation by Pavlov that the utmost care must be exercised when studying the conditioned reflexes to exclude all stimuli, however trivial they may appear, except the one under consideration.

Under the most favourable conditions, however, it has up to the present been usual to find a considerable unavoidable margin of variation in the results of many physiological experiments. By regarding these provisionally as "*chance*" variations, considerable help may be obtained by the application of the theory of errors, based on the theory of probability. In reality this is an empirical method, of which Poincaré has said that "everybody firmly believes in it, because mathematicians imagine that it is a fact of obervation, and observers that it is a theorem of mathematics," but nevertheless, although it cannot, as seems sometimes to be assumed, be used to replace accurate observation, it does enable a result to be brought out which might otherwise be obscured by small variations beyond our control. Research by such statistical methods provides a useful method of investigation, as, for instance, in the study of the toxic or other action of drugs, the data of the œstrus cycle, &c. An elementary deduction which can be drawn from the consideration of these facts is that, where only a few experiments of any kind are performed, important conclusions cannot be drawn unless it can be shown that the conditions are so controlled, and the accuracy of the actual observations so high that the sum of the individual "chance" variations must be small. Observation of this precaution would, in my opinion, reduce the bulk of contemporary physiological literature very materially, with a corresponding improvement in its quality.

Lastly, as a means for evolving generalisations out of experimental data, and of bringing these into relation with the generalisations of other branches of science, the use of mathematics is incontestable. One need only mention as examples the fresh outlook which has been provided for further investigation by the exact study of the data relative to the segregation and recombination of hereditary factors, the beautiful investigations of L. J. Henderson on the equilibria in the blood, the theoretical study of the phenomena of excitation, the employment of thermodynamics, and the numerous other applications of physico-chemical theory.

[Prof. Lovatt Evans then commented on the reunion between physiology and chemistry, which had given rise to the science of biochemistry, and briefly outlined the relations of physiology to zoology, botany, anatomy, and psychology. From his concluding section on the philosophical position we select a few stimulating paragraphs :—]

PHILOSOPHICAL CONSIDERATIONS.

Although the application of those sciences which are called "exact" is of immense value to physiology, we must be under no misapprehension as to their real relation, which is merely that they enable the phenomena of life to be described more accurately. They in no way furnish an explanation of those phenomena or enable us, without direct reference to physiological facts, to forecast them. The so-called exact sciences appear to be so because of the simplifications of which they are capable, by reason of which problems can readily be formulated and attacked. Disturbing conditions can provisionally be ignored or allowed for, and a first approximation reached which can be corrected later. In biology this can less readily be done. It is the failure to appreciate this elementary fact which leads some of those trained only in the methods of the exact sciences into the most palpable and unpardonable blunders when they attack biological problems. To take a simple illustration, no amount of pure physics, chemistry, and mathematics would have enabled the intricate and beautiful physico-chemical adaptations which have been shown by L. J. Henderson to happen in blood, to have been predicted, because these adaptations depend, among other things, on the presence of membranes round the red cells, fashioned by the living cells and having properties incapable of prediction. The investigation of the equilibria themselves, in their physiological significance, was a necessary preliminary to the introduction of physico-chemical theory. When these phenomena, and deductions from them, became known, it was possible for the physical chemist to step in, apply the appropriate theories, and thus enable the phenomena to be more accurately described in his own language.

But the fact remains that this description turns entirely on the postulated physico-chemical properties of the membranes as deduced from their actual behaviour under given conditions in what are in reality physiological experiments. It brings us no nearer to an explanation, perhaps, but it certainly does enable us to link up some of the phenomena of life with phenomena in the non-living, and so to describe them in terms which we think we understand better, because for some reason we regard physics and chemistry as more fundamental sciences than biology. Whether they are really more exact, however, is a point which might be debated.

The process of application of the exact sciences to physiology consists in reality of studying the phenomena themselves and then adopting the most plausible explanation capable of formulation in terms of the exact science. There is no other way. But let us be under no illusion about finding final explanations of what life is by this or any other methods.

Physiologists, in attempting to know what life is, have in my opinion attempted too much, and I think that a new standpoint is essential. One of the greatest of contemporary thinkers, L. J. Henderson, has recently submitted an argument with which I venture humbly to agree. The idea of adaptation, urged by Claude Bernard, should be adopted by physiology as its basal principle, as the chemist accepts the conservation of matter or the physicist the conservation of energy. We need not seek to know why it is so : that is the province of the philosopher ; all our experience tells us that it is so. It is not a definition of what life is, but a brief statement of its way, which is valuable, stimulating, and true. But we must treat the organism and its environment as one if we are to gain a proper insight into the adaptations manifested by the former. Life is conserved by adaptation, and I venture to think that this conception will be useful alike to general biology, to physiology, and perhaps most of all to pathology. For there is no fact in biology, pathology, or therapeutics which may not profitably be viewed from this fundamental physiological standpoint.

THE TREND OF MODERN PHYSIOLOGY.

In many ways a great future lies before physiology. Utilising the other sciences as its tools and itself reacting powerfully on them, we can confidently predict progress to undreamt-of heights, an enormous development of experimental pathology and medicine, and far-reaching effects on economic and sociological conditions. Yet, implicit in these very potentialities, there is another and a gloomier side to the picture. The rapidly accumulating wealth of detailed knowledge and of special technique demands an increased specialisation ; unless there is a periodic intellectual stocktaking there must inevitably be a loss of perspective and of grasp of great general principles. But how can this stocktaking be done ? Can team work ever reach that harmony of action which distinguishes the individual ? Any scientific subject is capable of indefinite expansion, and with the biological sciences it is hard to foresee what the ultimate end of *mere* expansion can be. How will scientific literature develop ? Will there have to be abstracts of abstract journals and reviews of reviews ? Will the subdivision of the subject necessitate in the long run the creation of lectureships or professorships to deal, for example, with the special physical chemistry of heterogeneous equilibria in biological systems, with intermediary metabolism, with the problems of hæmodynamics, or growth, or reproduction ? If so, how will the results of their special investigations be brought to common ground if no great unifying principles come to light ? Can we expect that such unifying principles will appear ; if they do not, will the progress of science be brought to an end by the accumulation of its own products ?

The establishment of special research professorships, however profitable in isolated cases, cannot in my opinion make good this growing specialisation, because it will tend to divorce research and teaching and place the teaching professor on a level of real or apparent inferiority. The idolisation of research for the sake of the advancement it brings is another of the dangers which threaten us. If there is one thing worse than "a mediocrity who does no research" it is "a mediocrity who does." There are at the present time a large number of junior research posts available, but not enough well-trained people adequately to fill them. This is all to the good provided that those who on trial show no aptitude for the work can be ruthlessly eliminated. As they often cannot, there are in consequence a number of young people who drift from one research scholarship to another, perhaps not aimlessly, but with no better objective than the manufacture of papers designed to justify their employment. The hapless editors of each of the swelling tide of journals are coaxed, hoodwinked and, if necessary, bullied, to ensure that these papers see the light of day. In the fullness of time the list of short-time research posts is exhausted, and the young investigator must now either turn to some entirely different occupation or else, as one of my friends expressed it, "subside into a professorial chair" for which, incidentally, he is probably entirely unfitted. The pursuit of science is nowadays, perhaps unfortunately, a career, and one in which moreover it pays to advertise. Science, we are often told, is the cream of civilisation. If we believe this let us use all our endeavours to ensure that it be not a whipped cream, specious, puffed up with wind, and presenting a fictitious appearance of solidity.

Lettsomian Lectures

ON

RHEUMATIC HEART DISEASE IN CHILDHOOD.

Delivered before the Medical Society of London

BY F. JOHN POYNTON, M.D., F.R.C.P. LOND.,
PHYSICIAN TO THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET; PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL.

LECTURE I.

Delivered on Feb. 20th, 1928.

IN these three lectures I shall pursue three particular themes. The first is the correlation of the pathological lesions of the heart with other rheumatic lesions; the second the clinical manifestations of rheumatic heart disease; the third the treatment of the heart disease. This lecture deals with the first theme, and the pathological lesions will be considered under two headings: (1) Those in the connective tissue skeleton. (2) Those in the "noble" tissues—for example, the heart muscle and nervous tissues.

There is general agreement that acute rheumatism is the result of an infection and that this infection is dependent upon various predisposing causes. These, however, are not generally agreed upon and are in process of careful investigation. In accordance with my own conviction, I shall assume the infection to be a diplococcus of the streptococcal group, though I admit that medical opinion generally inclines to the view that the cause is not yet known, and I recognise that the next great scientific move must be further extensive research in this direction.

1. THE LESIONS OF THE CONNECTIVE TISSUE SKELETON.

The earliest lesions in the myocardium, as shown in histological sections demonstrated before the Royal Medico-chirurgical Society in 1899, are scattered foci of cellular infiltration and the appearance of multi-nucleated cells between the muscular fibres. These are, in my opinion, the antecedents of the Aschoff nodule.

Aschoff's nodule has been the basis of extensive and world-wide research, in this country particularly by Dr. Carey Coombs, who says: "The submiliary nodules in myocardial rheumatism consist of rounded or fusiform areas formed by large spindle-shaped cells lying in the intermuscular trabeculæ of connective tissue." The average length he would estimate as somewhat less than 400 ft. "The special cells," he says, "are much larger than the fibroblasts of ordinary inflammatory reactions, to which in other respects they closely approximate. They are multinucleated, the chromatin substance of the nuclei in most cases appearing as a sharply defined margin with a small central mass or masses; the rest of the nucleus takes no stain and thus gives the cell a vacuolated appearance. They are surrounded by plasma cells and leucocytes, chiefly of the mononuclear variety. The nodules frequently arise in connexion with an arteriole, either around it or even in the wall itself, and their eventual fate appears to be cloudy swelling or cicatrisation." My view is that these nodules are the first signs of healing in a rheumatic lesion, and that they are probably evidence of a streptococcal infection, but that their absence from the lesions of a fatal acute rheumatism is no proof that the condition is not rheumatic.

When there is a severe infection the changes in the connective tissues, be it subcutaneous nodule, pericardium, cardiac valve, or synovial membrane, are all built on the same plan. The subcutaneous nodule is the best illustration, because it affords a complete example on a small scale. In the centre of the infected area there is necrosis, in the adjoining zone leucocytic infiltration and cell proliferation, in the outer zone vascular dilatation and swollen and often gelatinous-looking connective tissue fibres. Identical nodules were demonstrated by Sir Thomas Barlow in the pericardium and endocardium more than 40 years ago, and in the original paper on the rheumatic nodule, published in 1881, Warner and Barlow said: "Such nodules belong strictly to the fibrous tissues, and in nature are probably homologous with the inflammatory exudation which forms the basis of a vegetation on a cardiac valve." The results of the healing of these lesions are also clear; the necrotic tissue must be replaced by scar tissue, which in the nodules is negligible, but which in the pericardium may lead to adhesion or to great thickening of the layers, and in the valves to deformity.

The Necrotic Areas in Rheumatic Lesions.

The point on which to focus attention now and in the future must be the degree of perfection of the healing of the necrotic areas in the connective tissue skeleton. This is very difficult while the nature of the infective agent remains doubtful, and will continue difficult even should it prove to be streptococcal.

All my investigations with Dr. A. Paine, into the morbid anatomy, suggested that the infective agent would most probably be found where the zone of cell exudation merges into the dead tissue, for just at this point the infection has killed the resistance of the cells, but has not become, as it were, buried in the necrosis that it has produced. We need to know the frequency, duration, and extent of these unhealed lesions, especially in the connective tissue of the heart. We want, still more, to know whether they contain the infective agent in some form or another. I purposely say "in some form or another," because if the infection is unknown it may, when discovered, be found to assume some resting phase in such areas. Dr. Paine and I showed, at a pathological meeting of this society in 1911, that the diplo-streptococcus could be converted, by alterations in media in vitro, into very long chains or into a micrococcus indistinguishable in appearance from a staphylococcus. If a section of a gross streptococcal endocarditis is made in a region where there has been an effort at healing, we find the micrococci toward the healing area staining red, not blue, with methylene-blue, and later still becoming unstained refractile specks in the light blue fluffy necrotic tissue. The question is: are they then dead? If we watch a culture growing on such a medium as milk under the highest [illegible] ite refractile dots, [illegible] the fully developed diplo-streptococcus. If the infection is streptococcal these areas of necrosis are weak links in our knowledge of the morbid anatomy. Though I may seem to be dwelling upon recondite details, I am really only echoing the difficulties of the clinician who asks: When is an attack of rheumatism cured? How can

I ascertain this? What is the importance of unexplained fever in acute rheumatism? When we look at these questions from the aspect of morbid anatomy we can well understand how much further investigation is required to answer them, and how much our difficulties are increased by the great rarity of fatal rheumatic heart disease in the very earliest phases of the illness in man.

Some light is thrown, however, upon the destruction of the rheumatic infection by experiment and by some observations made by Dr. Paine and myself in 1911 upon experimental appendicitis in young rabbits; and in 1912 upon acute appendicitis in man associated with follicular tonsillitis. The same streptococcus was isolated from the tonsils and the appendix, and produced a series of cases of multiple arthritis and appendicitis in rabbits. The advantages of these investigations were that the animals could be killed in the early stage of illness and that the human appendix was in an early phase of acute infection. We hardly ever obtain such a lesion as rheumatic endocarditis at this early stage.

Possibly the rapid recovery of arthritic, compared with cardiac lesions, is due to the extreme vascularity of the synovial membranes and the profuse leucocytic reaction in them, combined with our ability to keep joints at rest. The cardiac valves are under great disadvantage, but a mitral valve which has been slightly damaged by a row of marginal vegetations will, in course of time, heal with slight thickening only; this in turn may smooth down and become of no functional importance, as clinical experience has amply demonstrated.

Every investigator of acute rheumatism must be struck by its general resemblance to tuberculosis, and I would compare the acute phases of the two infections.

Chronic Rheumatic Infection: Mitral Stenosis.

I now come to another type of lesion in which the invasion of the connective tissue skeleton is subacute and distinguished by a slow process of fibrosis. This type we all know too well as the cause of what is probably the most serious form of organic heart disease: mitral stenosis. Our efforts to ameliorate rheumatic heart disease must depend to a considerable extent upon a better understanding of the life history of this type of rheumatic infection.

At the onset we are met by two puzzling problems. Why is this type so much more frequent in the female? and does the process of fibrosis depend entirely upon the infective agent or is there also some tendency in the individual tissues to react in this fashion? This second question is of great clinical importance and may be put in another form: does a severe mitral stenosis result from a single prolonged attack of rheumatism, or does it more frequently result from repeated and often unrecognised reinfection or recrudescence? The brutal attacks and the gross injuries of infective processes in human beings we comprehend, but it is the quiet, stealthy movements of infection that are so baffling and so likely to lead to wild theories and sometimes equally wild methods of treatment. The chordæ tendineæ of the mitral valve of a rabbit is but a mere thread of connective tissue, yet by intravenous inoculation we can demonstrate that the infection fastens upon one segment of this slender cord.

In one little girl who died of rheumatic myocarditis in a first attack, I traced at the bedside, in the short period of five months, the development of the physical signs of mitral stenosis in a valve at first apparently healthy. The cusps after death were greatly thickened throughout, but showed no projecting marginal vegetations. The sections showed a condition identical with that found in a rheumatic nodule.

Dr. Carey Coombs, in his valuable monograph upon rheumatic heart disease, gives excellent illustrations of similar changes in the musculi papillares. Such extreme damage to the cusps of a valve as occurred in the small child might well, if she had survived and had no further attack, have caused sufficient contraction to produce a grave stenosis. There are, however, many cases in which one suspects obstinate recurrent infection as a more probable cause of severe stenosis. This is shown, for example, by repeated attacks of chorea as evidence of recurrent activity of the rheumatism. Let us hope that recurrent rheumatism is more usual, for upon this hypothesis there is more encouragement to efforts at prevention. This chronic process of fibrosis is sometimes met with in the aortic and tricuspid valves, and also in the myocardium.

Many physicians have noticed the occurrence of a chronic arthritis of the hands in association with advanced mitral stenosis, and there is also a considerable number of examples of fibrosis of the kidneys with the same association. It is difficult to speak with any certainty of a chronic arthritis of rheumatic origin in the child, although I suspect that it may occur in exceptional cases. Rheumatic nodules may undoubtedly remain for long periods of time, reach a considerable size and show much fibrous change under the microscope, as also may a chronic fibrositis and tenosynovitis in the palms of the hands. Some cases of chronic arthritis I have seen have been complicated with sclerodermia and with endocarditis of the sclerotic type, but these are very rare and their rheumatic origin may be questioned.

My experimental observations, made with Dr. Paine on endocarditis, suggested that infection of the valves takes place from the coronary circulation and not from the blood in the heart chambers, and that morbid changes begin within the structure of the valve as they do within the wall of the vermiform appendix.

The Pericardium.

The morbid changes in the pericardium also begin within the pericardial tissues beneath the endothelium. When the inflammation is severe, an infinite number of necrotic areas appear and destroy the endothelium, thus producing the shaggy appearance. In the subendothelial pericardial tissue there are vast numbers of blood capillaries, and their distension and rupture explain the fact that acute rheumatism is the most frequent cause of hæmorrhagic pericarditis. The numerous foci of inflammation account both for pericardial adhesion and for the fact that when a pericardium has been thought to be generally adherent a renewed outburst of infection may lead to a localised but unexpected reappearance of friction in some area which has not become glued down by the earlier attack. The chronic fibrotic type of pericarditis, in which nodules of considerable size may be found and in which great thickening may occur, is of clinical interest, because it may very closely simulate a pericardial effusion, and thus prove a pitfall to the clinician or radiologist who is not well acquainted with the possibilities of rheumatic infection.

It is generally accepted that an extensive pericardial effusion in childhood—i.e., one sufficient in itself to strangle the cardiac movements—is altogether exceptional. However extreme the area of cardiac dullness, the physician's first thought must always be: is this the result of cardiac dilatation, or of dilatation with a thickened and adherent pericardium?

Prolonged periods of pericardial friction and its reappearance when, after a latent phase, the infection again becomes active, make it easier to prove that an obstinate but active infection is the cause of a thickened and fibrotic pericardium, than that it is the cause of a chronic valve lesion. In some exceptional cases the process may affect not only the pericardium but both pleuræ, and the result is the remarkable sequence of events met with in multiple serositis. These are: strangling of the heart, much enlargement of the liver and spleen, and recurrent and severe ascites. In childhood, however, this is more frequently due to a chronic tuberculous infection of the serous membranes. In other cases chronic infection of the pericardium, pleuræ and mediastinal tissues causes an indurative mediastino-pericarditis which eventually, by gross mechanical shackling of the heart, produces fatal consequences without the repeated outbursts of active infection that occur in multiple serositis. The healing of a severe pericarditis is and must be slow, and the presence of partially healed and dangerous necrotic areas in the pericardium is of interest.

A girl admitted to hospital in the middle of January, with severe pericarditis, eventually recovered from all active signs of the disease, but the heart was so greatly injured that she died in the middle of April. The post-mortem examination showed that, although the pericardium was becoming generally adherent, the adhesions at the back were still soft and only partially formed. This gives definite information upon the slowness of the process of healing of a severe pericarditis. Even if the adhesions had been sound and firm, the recovery of the cardiac muscle would still have to be reckoned with. This proved to very imperfect, and extensive fatty change was present throughout the heart wall. The bearing of these observations upon treatment is obvious.

The danger of active foci is well illustrated by another child who was in hospital eight and a half months with repeated outbreaks of recurrent pericarditis, persistent fever and recurring subcutaneous nodules. After death great thickening of the pericardium was found, but there was no fluid in the sac and only a few recent adhesions were present. Here there was continual activity and a condition which I should term a malignant rheumatic pericarditis.

Interstitial Lesions in the Myocardium.

The interstitial tissues of the myocardium are damaged in rheumatism much as the endocardium and pericardium are. In my experience it is unusual to see the extensive scar formation such as occurs, for example, in syphilis of the heart, but in inveterate cases extending beyond the age of childhood this may occur, and the resulting perivascular fibrosis is exactly comparable with that seen in chronic appendicitis and in rheumatic arthritis, which affects the vessels of the synovial membranes and doubtless interferes with their normal function. .

Clinical investigation has proved that from time to time the miliary lesions in the connective tissue closely connected with minute arterioles may damage in some degree the conducting fibres of the cardiac mechanism Temporary heart-block is an example.

Malignant Endocarditis.

There is another problem in the morbid anatomy of acute rheumatism which in some respects is the most important of all. Can the infection develop a local virulence and then obtain almost complete mastery of the situation? or, when a local predominating bacterial virulence occurs, is it because the rheumatic disease has prepared the way for other infections? No one can possibly answer this question until the cause of acute rheumatism is decided, and for this reason alone I look upon the problem as one not for controversy but for research. It is essential that the facts should be thoroughly understood. For example it is common knowledge that in "subacute bacterial endocarditis" a patient often complains of rheumatic pains. This may or may not be evidence of the rheumatic nature of the disease. It is well known that rheumatism often attacks more than one valve, and it is interesting to find the overwhelming frequency of the combination of the mitral and aortic lesions, that is, of damage to two valves in close proximity. This combination is very frequent in childhood and of the greatest clinical importance. If these cases are traced into adolescence, and some of them suffer from repeated attacks of rheumatism, they may die of malignant endocarditis. It is this combined lesion which in my experience most often develops malignant endocarditis. Among cases with a rheumatic history are found not only malignant endocarditis and fugitive pains, but also multiple arthritis, nodules, Osler's spots, and pericarditis. Further, as post-mortem and clinical evidence show, the arthritis and the pericarditis may subside but the endocarditis come gradually to the fore and prove to be of the malignant type. Streptococci may be recovered from the blood in severe rheumatism and yet the patient may recover. Sir William Willcox recorded the case of a man from whom Dr. Paine had isolated the micrococcus from the blood during an attack of pericarditis, and who was at work seven years later; I have had other examples in childhood. It is well known, on the other hand, that in many cases of malignant endocarditis the streptococcus cannot be isolated from the blood for long periods and sometimes not at all. In 1912 I showed at this society the heart of a boy, aged 7, who died in his first attack of acute carditis. On the mitral valve was a large fungating vegetation, and there had been arthritis and severe pericarditis with an unusually copious hæmorrhagic effusion. Large subcutaneous nodules may also occur in cases of malignant endocarditis associated with rheumatism; in one of these we demonstrated the micrococci in a minute blood capillary.

I lay stress upon these points because it is of the utmost importance for the future of the treatment of heart disease, and for the elucidation of the cause of acute rheumatism, that a decision should be reached as to whether or not there is a malignant type of rheumatic endocarditis. If there is, then it will mean that the cause of the disease "acute rheumatism" is ascertained; if there is not, we are left with two difficulties for solution. The first is the discovery of the real cause, and the second is the reason for the frequent association of a streptococcus with the lesions of acute rheumatism, for the appearance of this micrococcus has perplexed investigators all over the world. In the cases of the type of which I am speaking the only difference in the morbid anatomy of the valve from that of a simple rheumatic endocarditis lies in the necrotic tissue of the vegetation. In the first it is crowded with the micrococci, but in the simple form they are destroyed or apparently destroyed, and must be searched for in the zone abutting on the necrotic area, where they will only be found in scanty numbers. This difference seems to me the essential factor in the problem, and all the secondary consequences of an active local focus impinging on the blood stream merely confuse the issue by producing a general septicæmia and diverse symptoms from infarctions, which naturally lead us to believe that we are dealing with a disease of different nature from acute rheumatism. The alternative explanation, that this form of endocarditis is the result of a secondary infection attacking damaged valves, is undoubtedly much more easily comprehended, because it is most difficult to find the micrococci post mortem in the valve of simple endocarditis, but in the malignant endocarditis they abound.

Is rheumatic endocarditis frequent in the young? and are the possibilities of secondary infections fro tonsillitis, from septic sores, from otitis media, fro empyemata and broncho-pneumonia, frequent? A we are compelled to answer both questions in th affirmative, malignant endocarditis should be frequen in the rheumatic child, and yet, as a fact, it is exceptional. Fatal rheumatism and tuberculosis in the young have almost invariably a widespread distribution. It is in later life that, in both diseases, a local lesion comes to the front and overpowers all resistance. We have to explain the exceptional cases of malignant endocarditis in the rheumatic child by supposing that other lesions, such as the pericarditis, the arthritis and the nodules, may behave in the usual fashion of acute rheumatism and subside, and yet the endocarditis progress. Have we, then, two acute processes occurring simultaneously, one undoubtedly streptococcal and the other the mysterious rheumatic infection? If the damaged valve—the result of past attacks of rheumatism—only serves to give a foothold to the secondary infection, why should the rheumatic infection become active in other organs simultaneously? When we consider malignant endocarditis and rheumatism, it becomes apparent how vital the bearing of streptococcal infection is on the problem of causation. Twenty-five years ago Dr. Paine and I remarked to one another that the great battle as to causation would be fought not over acute rheumatism but over this form of endocarditis, and I still hold that view.

Recent Investigations.

A recent paper by K. E. B. Birkhaugh[1] is one that must arouse attention. Here, again, a streptococcus is the centre of interest. When we brought forward our first paper in September, 1900, we were faced by the difficulty that if we called the micrococcus a streptococcus the reception would be: "These gentlemen have rediscovered the streptococcus pyogenes"! There was then no general realisation of the complexity of the streptococcal group. That difficulty has long passed away, to be supplanted by the converse and formidable problem of how to distinguish the various groups of streptococci. The researches of Swift and Kinsella, Andrewes and Derick, could find no specific type of streptococcus in acute rheumatism. Then came the work on scarlet fever, and the development of the Dick test. Here, again, we find the streptococcal group in evidence, and we must remember the association of scarlet fever and rheumatism. Birkhaugh isolated, from an acutely fatal case of juvenile rheumatism, what he terms "a new species of non-methæmoglobin forming, inulin-fermenting, bile-insoluble and toxigenic Gram-positive streptococcus." This he also isolated from the tonsillar crypts, blood and cardiac vegetations, fæces and urine. He groups it apart from the *Streptococcus hæmolyticus* and *Streptococcus viridans*. Among 68 strains of this streptococcus 72 per cent. were found to produce a soluble toxic filtrate with which 76 per cent. of rheumatic children gave positive skin reactions. Intramuscular injections of increasing doses in laboratory animals and in human beings susceptible to the toxin produced a neutralising antitoxin. The micro-organism injected into rabbits produced the various manifestations of rheumatism. Finally, the author of the paper, who had previously given a strong positive intradermal reaction, produced in himself, by intra-articular and intramuscular injections of large doses of the soluble toxic filtrate, an acute polyarthritis of the rheumatic type. This is a research which, if it meets with confirmation from other investigators, will mark a definite step forward in our knowledge of the causation of acute rheumatism, but it clearly needs very thorough confirmation, and at the moment I use it chiefly as an illustration of the modern lines of thought on the problem of the streptococci.

In association with rheumatic carditis we sometimes meet with unusual rheumatic manifestations such as phlebitis. I believe this to be of the same type as the other lesions: an interstitial inflammation in the wall of the affected veins. Similarly the peritonitis is strictly akin to the pericarditis, pleurisy, mediastinitis, arthritis and tenosynovitis. Again the tonsillitis, when severe and still more when recurrent, will lead to fibrosis and, as a result, the penning up of foci of infection deep from the surface. Surgery has now demonstrated this incontrovertibly. The involvement of the tonsillar cervical glands is easily understood, and the study of the morbid anatomy of the disease leads us to believe that in these glands there will be great destruction of the infective agent if it is streptococcal. Clinical observation bears out the morbid anatomy, for there is a large group of mild rheumatic infections which show themselves in sore-throat, enlargement of the cervical glands, and a passing cardiac dilatation from the escape of the infection or its toxin into the system.

2. LESIONS OF "NOBLE TISSUES."

In the second group of lesions caused by the rheumatic infection we are once again confronted by a large unexplored field, and realise how essential it is to decide the exciting cause of the disease. We know nothing fundamental about the nature of the poisons in acute rheumatism, or to what extent they act by direct injury to the tissues or by the more subtle process of building themselves into them and thus producing some more or less permanent alteration in the normal metabolism. The bacteriologist and biochemist will no doubt slowly solve some of these essential problems which the clinician and morbid anatomist can but dimly recognise. We know with certainty that direct damage is done to the muscle of the heart and to a lesser degree to the nervous system, as shown by the meningo-encephalitis of chorea. We suspect from the highly nervous temperament and the occasional thyroid enlargement of many rheumatic children that an attack of acute rheumatism may possibly alter the metabolism or, at any rate, the normal functioning of the tissues long after any active sign of infection has disappeared.

I am a firm believer in the hereditary factor in acute rheumatism. Upon this the private case-books of the late Dr. W. B. Cheadle, dealing with educated patients, gave clear evidence: in 30 consecutive cases 23 gave a family history, and in 103 out of 180 there was also family history in parents or near relatives. Again, when acute rheumatism attacks children under 5, there may be striking examples of this hereditary factor.

A female, aged 2, had severe rheumatic carditis with arthritis. Her father had had rheumatic fever, and her maternal uncle died of the disease. A female, aged 4½, had acute rheumatic arthritis, and her mother had three attacks of acute rheumatism and suffered from heart disease. A female, aged 3½, died from acute carditis. Her father had suffered from acute rheumatism, and her paternal uncle had died of the disease. A male, aged 4½, had an attack of acute rheumatism with arthritis and carditis. His father had also had an attack of acute rheumatism.

It is my belief that some peculiarity of constitution is transmitted to such children, rendering them less resistant to the infection, but it is impossible to speak with any certainty in our ignorance of the rheumatic toxins.

We know that the cardiac muscle may be terribly injured. Fatty changes are the most easily demonstrated, and on two occasions I have seen small cardiac aneurysms of the right ventricle, the blood in the cavity of the chamber being separated from the pericardial cavity only by the visceral pericardium. When there are also extensive and scattered lesions in the interstitial tissue, it can be readily understood how grave the results must be. It is most exceptional for this condition of the heart to be unattended by some degree of pericarditis, but cases have been recorded and death has resulted from acute asystole due to a primary rheumatic myocarditis.

Injury to the Nervous System.

I spoke of chorea as a rheumatic meningo-encephalitis—a view held by Dr. Paine and myself as the result of our investigations, further upheld by Dr. Gordon Holmes and myself, and again supported by the distinguished pathologist to the National Hospital for Nervous Diseases, Dr. J. G. Greenfield, in a detailed investigation of a fatal case of chorea, published in THE LANCET (1922, ii., 603). It is supported also by various Continental investigators. From the standpoint of morbid anatomy all are agreed that the lesions in the nervous tissues are comparatively slight. Recent years have, however, revealed to us much that was unknown before, for the appearance of encephalitis lethargica has shown us conclusively what devastation apparently insignificant lesions may produce in such a highly evolved organ as the brain. Not only may the physical disabilities be great, but the character of the patient may be entirely altered. We know that chorea is an outstanding result of rheumatism and attracts the attention of the most superficial observer. We also know that the rheumatic child is exceedingly nervous, and that in chorea there may be delusions and even a condition bordering on dementia. Rheumatic children may also, between attacks of acute rheumatism, suffer from prostrating headaches, from paroxysmal attacks of cyanosis of a limb, or spasms of the muscles, or intense neuralgic pains. Still more remarkable are attacks of anginal pain, in which there is undoubtedly a so-called functional element, but which nevertheless may prove fatal if there is organic disease of the valves. We cannot deal satisfactorily with heart disease in the young if we do not realise how important a part the nervous system takes in its management and treatment.

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[1] Journal of Infectious Diseases, May, 1927.

Chorea is the most frequent solitary manifestation of rheumatism, and yet it may be a precursor of and a manifestation in the most severe attacks. I believe that injury to the nervous system not possible to appraise in the terms of morbid anatomy may lower the resistance of children to the rheumatic infection, and that continual strain from brain work, not perhaps of any high degree of excellence, tells upon this kind of child much more than we recognise. On account of their keenness and lack of reserve nerve power, these children require more rest than others, and if they do not get it they are more likely to be attacked by the disease. I look upon lowered nerve tone as an important predisposing cause. Certainly no children with a severe attack of heart disease require more care and tact in nursing and handling. In many cases, also, excitability of the heart's action, which adds much to the difficulty of obtaining complete recovery, is by no means dependent upon an active myocarditis, but upon some damage in the nervous system.

Injury to the Blood.

Sometimes the streptococcus can be isolated from the blood stream and at other times it may be demonstrated in the diplococcal form in the [illegible] leucocytes. It would surprise me [illegible] these events were frequent, because the lesions produced are chiefly focal and the tissue-resistance to the infection is great, so that the micrococci are destroyed more or less completely in the lesions. The red cells suffer severely and the hæmoglobin in particular is damaged by the rheumatic poisons. The anæmia may be very slow in abating, and I suspect th[illegible] associated in adolescence with [illegible] favours the development of malignant endocarditis. Swift and J. R. Miller, junior, have recently investigated the white cells, and find that the leucocytosis may reach to 10,000 per c.mm. Their researches have been very careful and detailed, and they hold that anti-rheumatic drugs will control this leucocytosis, which will again assert itself should they be discontinued while the [illegible]. I am anxious to corroborate [illegible] clearly it may help us in estimating the progress of a case.

There may be other and more subtle changes in the blood plasma as a result of the rheumatic infection, but of such I have no knowledge.

SUMMARY.

I have endeavoured in this lecture to bring into prominence the two chief ways in which acute rheumatism damages the heart and other organs, basing my argument upon experimental and pathological investigations, with a streptococcus as the assumed cause. There are the local interstitial lesions which tend to necrosis and fibrosis, and there are the toxic effects of the circulating poisons. The interstitial lesions seem to me to produce results which clinical observation at the bedside corroborates: valvular lesions, pericarditis and local myocardial disturbances. The toxic effects of the infection, though well recognised at the bedside in the profound anæmia and damage to the cardiac muscle and nervous system, cannot yet be correlated with any definite poison, though I believe it would be difficult to prove that a streptococcal infection could not produce such results. I can imagine no more difficult problem than the isolation of these poisons, some of which may possibly only be produced in the living organism and not in vitro. If the exciting cause of the disease is still unknown, it is at least apparent that we must expect it when discovered to give us an explanation for the many ascertained facts of the morbid anatomy, and all who are interested in the great problem of rheumatism must look forward with eagerness to the solution. Whatever it may be, I should like to take this opportunity to say of my friend and co-worker, Alexander Paine, what that great genius from my native county of Somerset, Roger Bacon, said of Peter of Maricourt: "Of discourses and battles of words he took no heed, he followed the works of wisdom and in them found rest. Through experiment he gained knowledge of natural things."

CAROTID CAVERNOUS SINUS ANEURYSM.

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IN this article I refer particularly to carotid cavernous sinus aneurysm, but many of the references and figures relate to articles on "pulsating exophthalmos," a condition in which the exact pathological lesion is often unknown though the majority of cases are due to carotid cavernous sinus aneurysm. This condition, although uncommon, is not one of the rarities of medicine. There are still many points which require elucidating, and as it rarely falls to the lot of any one person to see more than one or two cases their record is valuable.

Classification and Ætiology.

The cases are classified into traumatic and spontaneous.

In the traumatic group the injury may be direct, such as a gunshot wound, but it is more usually caused by indirect violence, often a fracture of the skull.

In spontaneous cases the main factor is disease of the artery resulting either in its rupture or in the formation of a true aneurysm, which ruptures secondarily. A large proportion of these cases occur in females, and Hart,[1] writing in 1862, pointed out the ætiological significance of weakness after fever or childbirth. De Schweinitz and Holloway[2] found that the onset occurred during pregnancy in 14 out of 49 women suffering from pulsating exophthalmos. Strain may also excite the condition, although sometimes the onset occurs while the patient is at rest. Locke, in an important article[3] on pulsating exophthalmos, gave figures from which it appears that approximately three-quarters of the cases are traumatic, that three-quarters of the traumatic cases occur in men, and that three-quarters of the spontaneous cases occur in women.

The average age for the traumatic group is towards the end of the third decade, and for the spontaneous towards the end of the fifth decade.

The trauma may be very slight. Picqué[4] recorded a case in which the patient received a blow on the right eye which caused neither loss of consciousness nor any serious contusion to the eye. Cases of this kind probably belong ætiologically to the spontaneous group, the trauma acting as the final factor.

Anatomy.

The cavernous sinus is situated on the side of the body of the sphenoid and extends from the sphenoidal fissure to the apex of the petrous portion of the temporal bone. The superior ophthalmic vein drains into the anterior end of the sinus through the sphenoidal fissure, communication being thus established between the angular vein and the sinus. The inferior ophthalmic vein may enter the sinus or may join the superior ophthalmic vein. Posteriorly the cavernous sinus drains into the superior and inferior petrosal sinuses, which are closed in by rigid structures—bone and dura mater—and thus the effects of the arterio-venous communication are chiefly thrown on the veins draining into the sinus. Some of the cerebral veins drain into the sinus, which also communicates with the pterygoid venous plexus. Running through the sinus is the internal carotid artery, accompanied by filaments of the carotid plexus and the sixth nerve. Situated on the outer wall are the third and fourth nerves, with the ophthalmic and superior maxillary divisions of the fifth. The cavernous sinuses are connected by the circular sinus.

The ophthalmic vein, the third, fourth, and sixth nerves, and the branches of the ophthalmic division of the fifth pass through the sphenoidal fissure. The superior maxillary division of the fifth nerve passes through the foramen rotundum. The optic nerve, in close relationship to the anterior end of the cavernous sinus, passes through the optic foramen accompanied by the ophthalmic artery.

Symptoms and Signs.

The severity of these varies considerably with the size of the arterial rupture and the presence or absence of clotting. When arterio-venous communication is established the blood pressure in the cavernous sinus is raised, reversing the flow of blood in the ophthalmic veins. These pressure changes are also transmitted to the sinus of the opposite side, so that the symptoms and signs are occasionally bilateral.

The Bruit.—As a rule the first symptom is a noise in the head, which has been variously described as "humming," "buzzing" or "puffing." This noise may be either (1) continuous, with increase at each systole; (2) intermittent, corresponding to the heart systoles; or (3) continuous; it is a source of great annoyance to the patient and interferes with his sleep. The note varies with the size of the communication, and the intensity with the alterations in blood pressure, due to change of posture, exercise, &c. The noise may be so loud that it is audible to people near at hand; it may be heard in the temporal, parietal, and occipital regions, and in the ear and orbit. Pressure on the affected artery will usually stop it, but occasionally bilateral carotid pressure is necessary. Pressure at the inner canthus may stop the bruit. On auscultation it can be heard over the affected eye, usually over the whole head, over the facial bones, and along the course of the carotid artery involved. In traumatic cases it may be heard immediately the patient regains consciousness, but if the tear is a small one or if it is blocked by clot it may not become audible for some time. According to Rhodes[5] the average interval is 21 days, but the onset may be delayed for months or even years. In spontaneous cases it is usually sudden.

Exophthalmos is generally the next symptom to appear, and is classically but not invariably present. Typically it is of the pulsating type, but this again is not invariable, as is shown by the example of Delore, Aurand, and Roland.[6] The pulsation may be very slight, and detected only by pressure on the eye. At times the exophthalmos becomes so extreme that dislocation of the eye results. Williamson[7] writes: "On raising the upper eyelid to gain a better view, the eye suddenly shot out in front of the lids, like the forward dislocation that takes place when the speculum is pressed back after division of the tendons in the operation of excision."

Corneal ulceration may follow severe exophthalmos, and endanger the integrity of the eye. This is more likely to occur on account of the neurotrophic changes mentioned below.

Dilatation of Veins and Venules.—As a result of the increased blood pressure, dilatation and subsequent thickening of these vessels occurs at times with a pulsatile tumour, possibly with a thrill, situated typically in the upper and inner portion of the orbit on the affected side. Cauchoix[8] states that this tumour is present in from one-quarter to one-third of the cases. The dilatation may extend to the veins in the supra-orbital region or to the veins of the face as in Williamson's case,[7] in which pulsation and a thrill could be felt along these veins as far as the angle of the jaw. The congestion of the smaller vessels causes great vascularity and œdema of the conjunctiva. This chemosis may be so severe that the eye is hidden from view and ulceration of the conjunctiva ensue. Retinal examination shows dilatation and often pulsation of the veins, while the optic disc may be swollen.

Nerve Involvement.—Sometimes a nerve lesion is caused, either directly by the injury or indirectly by pressure and stretching in the sinus, in the sphenoidal fissure, or in the supra-orbital notch. In the two latter cases the superior maxillary division of the fifth nerve escapes. Stretching of the optic nerve follows the exophthalmos. Diminished vision or blindness, paralysis of the eye movements, ptosis, a dilated and fixed pupil, and loss of corneal sensation result. De Schweinitz and Holloway[2] state that 20·4 per cent. of cases of pulsating exophthalmos terminate in blindness, others have diminished vision, and not more than 11·1 per cent. retain normal vision. Of the nerves running in the sinus and its wall the sixth is that most commonly involved. Injury to the branches of the fifth nerve, which is the one least commonly affected, results in pain, as in Taylor's case[9] or in numbness, as in a case recorded by Berry.[10]

The symptoms described are typical of the condition, but are not necessarily all present. In Murray's case[11] there was bilateral exophthalmos, but no interference with the eye movements and no blindness. This is possibly accounted for by the presence of an unusually large communication between the two sinuses, causing bilateral exophthalmos while relieving pressure. Holmes[12] refers to a case in which the swelling of the conjunctiva was so great that the lower eyelid was covered and yet the eye was movable and the vision perfect.

In rare cases the eye-changes first appear on the side opposite to the lesion. This is difficult to explain, but possibly occurs when the arterial rupture is situated immediately opposite the opening of the circular sinus and the blood, as it is forced through the hole in the artery, transmits its pressure directly to the opposite side.

Differential Diagnosis.

The following conditions have to be differentiated from a carotid cavernous sinus aneurysm: (1) Pulsating orbital tumours—e.g., malignant tumours or cirsoid aneurysms. (2) Aneurysms of the ophthalmic artery in the orbit or within the skull. (3) Orbital arterio-venous communications—Lansdown's case.[13] (4) Orbital cellulitis. (5) Cavernous sinus thrombosis. (6) True aneurysms of the internal carotid artery in the cavernous sinus. These are much more rare than carotid cavernous sinus aneurysms and may, as in the case of Morax and Ducamp,[14] give rise to no symptoms unless the aneurysm ruptures. Barnard and Rigby[15] state that it is the aneurysm of the internal carotid alone which gives rise to the intermittent bruit. Holmes[16] and Adams[17] record examples of this condition, in each of which there was involvement of branches of the fifth nerve, but no mention is made of any exophthalmos, pulsation, or bruit. (7) Maynard[18] reported a peculiar case with pulsation and exophthalmos in which œdema of the optic nerve accompanied internal hydrocephalus.

There are a few cases on record which appeared clinically to be examples of this condition, but which at necropsy showed no communication between the carotid artery and the cavernous sinus.

Treatment.

Procedures adopted in the treatment of this condition are not without risk, and therefore one has to consider carefully whether these measures are justifiable. Rarely a spontaneous cure occurs. The condition may remain stationary, as in Williamson's case,[7] in which there was no alteration during a period of 23 years. A stationary case may again become progressive, as in the example of Bonnamour, Bujadoux, and Lyonnet,[19] where this occurred after an interval of eight years. Typically, however, the condition is steadily progressive and, although later the swelling and exophthalmos may diminish, there is a very grave risk of loss of sight. Further, the persistent noise in the head is a source of great annoyance to the patient from which he may demand relief in spite of the risk.

General measures are rest in bed on a light, dry diet, and the use of such drugs as iron lactate, potassium iodide, acetate of ammonia, and belladonna. Under such treatment cures have been recorded, but the results are so uncertain that the patient must be under careful observation so that an operation can be performed whenever necessary. If improvement occurs the patient must be warned of the danger of recurrence and advised to report at once any change in the condition. If the exophthalmos is very marked the eyes may be protected by suture of the lids. The subcutaneous or intramuscular injection, repeated every four to eight days, of 100 to 250 c.cm. of warm 2 per cent. gelatin solution in serum has been advocated.

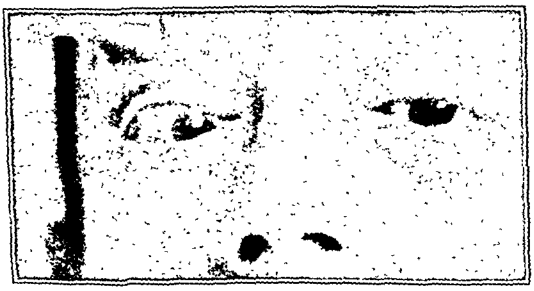
Direct attack on the aneurysm has been suggested but never attempted.

Measures applied to the carotid artery carry a greater risk in the spontaneous than in the traumatic group, as the patient is older and the conditions for surgical interference not so favourable. Further, as there is generalised disease of the blood-vessels, an efficient collateral circulation is less likely to become established.

1. Carotid compression by digital or mechanical means is tedious, and the results are uncertain. Clotting is more likely to ensue in the diseased vessel of the spontaneous cases than in the healthy vessel of the traumatic cases. Compression of the carotid is sometimes useful as an indication of the risks of ligature, for if it produces vertigo, motor, or sensory disturbances of the limbs or loss of consciousness, a preliminary course of carotid compression should be carried out in order to improve the collateral circulation.

2. Ligature of the common carotid is attended with risk both to life and to the normal functioning of the brain, as immediate ischæmia or later embolism may cause temporary or permanent hemiplegia or aphasia. The mortality-rate of this operation for this condition is under 10 per cent., whereas ligature of the vessel in cases of wounds, tumours of the neck, &c., carries a much higher death-rate. Local anæsthesia diminishes the risk of cerebral complications, as if any ill-effect is noted the ligature can then be loosened. The occlusion of the vessel should be carried out very slowly and gradually during a period of some minutes, or a Crile's clamp may be temporarily applied. A disadvantage of this operation is that a collateral circulation may be rapidly set up through the external carotid artery; to avoid this the latter may be ligatured at the same time.

FIG. 1.

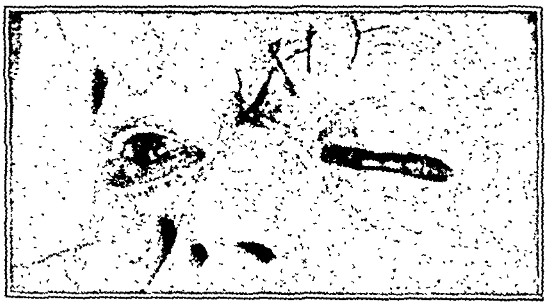


Condition before operation.

3. Ligature of the internal carotid artery avoids the disadvantage of ligature of the common carotid which has just been mentioned. The operation is rather more difficult, and for this reason it has been held that common carotid ligature is preferable in the spontaneous cases, as the vessel is probably diseased and there is risk of emboli becoming detached. A double ligature of the internal carotid has been attempted, the first ligature being applied in the neck and the second immediately proximal to the origin of the ophthalmic artery, but the result was fatal.

4. Bilateral carotid ligature. Following the ligature of the carotid artery the bruit usually ceases, but at intervals varying from hours to months it may return in a diminished form or with an altered note, and may then persist or increase in intensity or disappear again. With the return of the bruit the question of ligature of the opposite carotid artery arises. This should not be carried out until several months after the first operation, when the risk is apparently not greater than that attached to ligature of one carotid. Even then cure does not always result.

FIG. 2.



After ligature of veins at the inner canthus.

It has been stated that there is an ultimate diminution of cerebral function after ligature of both carotids, but this has not been confirmed.

Procedures on the orbital veins are of three kinds:—

1. Compression has been used alone or in combination with medical treatment, or combined with compression or ligature of the carotid artery. An interesting example of mechanical pressure in treatment is afforded by a case recently sent to see me.

A woman, aged 39 years, had suddenly noticed, after telephoning, a noise "like steam being let off" in the left occipital region. This was followed two weeks later by a swelling below the left eye. Five weeks after the onset there was ptos[illegible] diplopia with increased swelling. On [illegible] as a bruit which ceased on pressure ov[illegible] carotid and at the inner canthus of the left eye. The patient, who had noticed that pressure at the inner canthus gave some relief, was wearing pince-nez spectacles, and had had made a metal prolongation with a small pad to cause pressure at the inner angle of the left eye.

2. Other measures calculated to induce clotting, such as electrolysis, puncture with hot needles, and the injection of [illegible] iron lactate hav[illegible] and cure, but [illegible] whole have been considered dangerous. Now that the injection treatment of varicose veins has become popular, this method may receive more favourable consideration.

3. Operation on the orbital veins was first carried out by Lansdown[13] for a case of pulsating exophthalmos not due to carotid cavernous sinus aneurysm. This operation has been used (*a*) as a primary method of treatment; (*b*) combined with or secondary to carotid ligature.

Locke[3] says that under no condition should an attempt be made to perform an orbital vein ligature and a carotid artery ligature at the same sitting, as the results have been unfortunate.

The following types of operation have been used: (*a*) ligature of the veins at the inner canthus; (*b*) ligature of the superior ophthalmic vein far back in the orbit; (*c*) ligature of the inferior ophthalmic vein, which has been performed on one occasion.

I adopted the first of these methods in a case which came under my care.

A male, aged 40 years, was admitted on July 9th, 1927, with severe concussion and a fracture of the skull. An X ray examination confirmed the presence of a fracture in the right parieto-occipital region, but there was no evidence of involvement of the body of the sphenoid. He was discharged on the twenty-third day. Three weeks later he returned, stating that a few days before discharge he had noticed a throbbing noise in the left ear but had not mentioned it. It had persisted since, and was less marked on sitting up, while he noticed that it disappeared with pressure on the upper and inner part of the orbit. Three days after discharge he had noticed swelling of the lower eyelids "like bladders," and three days later double vision on looking to the right; 16 days after discharge both eyes were bulging, the right more than the left.

On readmission there was a paresis of both external recti with congestion of the conjunctivæ, more marked on the right than on the left. The vision and fundi were normal. A bruit could be heard over the whole head, maxillæ and left mandible, and the left common carotid artery. It ceased on pressure over the left common carotid or on the upper and inner part of the left orbit. There was no pulsation of the eyes, no exophthalmos, and no pulsating tumour. The branches of the fifth nerve were not involved.

As pressure on the upper and inner angle of the orbit caused cessation of the bruit, the supra-orbital and angular veins were ligatured under local anæsthesia. The bruit did not cease, and there was considerable hæmorrhage which had to be controlled by packing. Soon after this operation there was a double pulsating exophthalmos with great œdema and congestion of the conjunctivæ, which bulged forward between the eyelids. The pupils were dilated and irregular, and there was paralysis of all the eye movements. The noise in the head varied in intensity and at times ceased. Vision of both eyes failed rapidly. On the fifth day after operation it was decided, on account of the failing vision, to ligature the internal carotid artery, using a fascial graft from the thigh as a ligature. This operation reduced the noise in the head so that the patient stated "it takes me all my time to hear it." No bruit could be heard over the head or over the left carotid, but there seemed to be a very faint one audible over the right carotid. The œdema of the conjunctivæ persisted for some time, but one month later it had lessened considerably, and after another three weeks had completely disappeared, although there was still great vascular congestion of the conjunctivæ on both sides.

At present there is no exophthalmos and no pulsation. He has lost the sight of both eyes. There is still slight increased vascularity of the conjunctivæ. The pupils are semi-dilated and fixed and the discs show optic atrophy. There is a slight degree of ptosis of the left upper lid; the eye movements are normal except for a very slight degree of weakness of elevation of the left eye.

In 1906 Jameson Evans[20] reported a case of pulsating exophthalmos in a child of 6 after a puncture wound of the lower lid. Improvement followed treatment by rest, potassium iodide, and calcium chloride. Mr. Jameson Evans informs me in a personal communication that in April, 1907, he ligatured the angular vein as a primary procedure and cured the exophthalmos and bruit. From the nature of the wound this case was probably one of arterio-venous communication in the orbit.

Ligature of these vessels in cases of carotid cavernous sinus aneurysm is not to be regarded lightly, as the control of hæmorrhage may be difficult on account of the extreme vascularity. This has been noted by other authors—e.g., Flemming[21] and Cauchoix.[8] The latter states that the operation is of use only if a dilated vein is to be seen. My case suggests that the severity of the condition may even be increased by this operation. This may be accounted for by the presence of a resulting thrombosis in the cavernous sinus or by the partial cutting off of the means of escape of blood from the sinus, resulting in further congestion of the ocular and orbital vessels. An exaggeration of the condition has occurred in other cases, but not to such an extreme degree. Pritchard and Burghard[22] found that after ligature of the right internal angular vein, which was accompanied by severe hæmorrhage, there was no perception of light for some days. Gifford[23] recorded a case in which, after ligature of the common carotid and a much dilated vein in the upper lid, there was a temporary increase in the severity of the symptoms with increased exophthalmos and ulceration of the cornea. In the same article he refers to five cases of pulsating exophthalmos, including his own, in which this operation was performed; in three of these there were "alarming symptoms." This operation appears to give the best results in cases of arterio-venous communications in the orbit, but in carotid cavernous sinus aneurysm the results may prove less satisfactory than those of carotid ligature.

Pollet and Decherf[24] used periarterial sympathectomy in one case, with a short temporary improvement followed by a rapid increase in severity.

Resection of the cervical sympathetic, combined with carotid ligature, has been advised in order to produce a vasodilatation and so diminish the risk of cerebral complications. The use of vasodilator drugs for the same purpose has also been advocated.

Ridley[25] refers as follows to a case in which common carotid ligature had failed: "In this case, long after ligation of the common carotid, the facial artery dilated until it became as thick as one's little finger, where it joined the orbital arteries. It was tied. The proptosis and the pulsation all ceased, and that patient, although she lost her vision under pressure, had no trouble and practically no proptosis now."

Progress.

In favourable cases the bruit disappears immediately but may return, to disappear again later. Rivington,[26] in an excellent article, referred to a case in which Corner ligatured the right common carotid artery; the bruit persisted for 12 years and then disappeared. The interval here was so long that the cure would appear to be spontaneous rather than a direct result of the operation. The remaining symptoms improve slowly, the exophthalmos and chemosis taking a period of three to six weeks to disappear. The conjunctival congestion persists for a still longer period. The muscular paralysis and vision improve slowly.

De Schweinitz and Holloway[2] state that cerebral complications occur in 9·8 per cent. of common carotid ligations. This complication may arise at a considerable interval after operation, and convalescence must therefore be slow.

Below is a table taken from Locke's article[3] which tabulates the results. In comparing the mortality of common carotid and internal carotid artery ligatures in this table it is to be remembered that only the former was used in the earlier days, when infection increased the number of fatal cases.

Pulsating Exophthalmos: 1809 to 1923.

Percentages.	Digital compression (106).*	Ligation common carotid (234).	Ligation int. carotid (38).	Bilateral ligature (21).	Ligation orbital veins (19).	Ligation artery and veins (24).	Rest and medication (28).	Gelatin injections (16).
Cured Imp.	} 26·41	} 65·81	21·05 65·79	} 61·91	42·12 26·31	37·50 33·33	14·29 35·72	31·25 31·25
Neg.	73·95	23·93	5·26	19·05	26·31	12·50	42·88	37·50
Fatal	—	8·98	7·90	14·28	5·26	16·67	3·57	0
Unst.	—	1·28	—	4·76	—	—	3·57	0

* The figures in parentheses indicate the number of cases. Imp. = improved. Neg. = negative. Unst. = unstated.

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THE AFTER-CARE OF EPILEPTIC CHILDREN.

A SURVEY OF CHILDREN WHO HAVE ATTENDED A RESIDENTIAL SCHOOL FOR EPILEPTICS.

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THIS survey has to deal with a total of 351 children who left the Lingfield Colony school during the period of eight years between Oct. 1st, 1919, and Sept. 30th, 1927. Children who attended the school for periods shorter than six months are not included.

Preliminary Note.

It is essential first to define the type of child dealt with. It would be a mistake to suppose that in a certified residential school any and every child subject to epileptic fits may find a place. The Board of Education divides epileptic children into two classes: those whose disease is so severe that it precludes them from attending ordinary elementary schools, and those whose disease is, in this sense, "not severe." The latter class outnumber the former by about two to one.[1] Only "severe" cases are eligible for residential special schools and, as a matter of fact, only one-fifth of all the severe cases are accommodated there. Of the remainder a few are retained at elementary schools, some drift into poor-law and other institutions, while half of them, numbering in England and Wales at least 1350, are allowed to remain at home receiving no education at all.[1] The principal reason for this unsatisfactory state of affairs is deficient residential school accommodation; other reasons are unwillingness on the part of parents to let their children leave home, or neglect on the part of local education authorities.

It will be understood that the parents of children who are a bother to them on account of frequent fits or difficult temperament will press for their admission to a residential special school; and there is, no doubt, an unduly high proportion of such cases in the group under review.

Only "educable" children can be admitted. In this connexion the "educable" class includes, roughly speaking, all normal, dull and backward and feeble-minded children, but excludes imbeciles and idiots. By Binet or similar mental tests the lower limit of educability is reached with an intelligence quotient in the neighbourhood of 50. It must be remembered, however, that there are among epileptics a certain number of children whose intelligence either remains stationary or actually deteriorates, so that from time to time children in a school for epileptics fall from the educable into the ineducable class, and have to be discharged.

A further point with regard to the type of child requires mention. Most of the certified schools for epileptics are, like Lingfield, voluntary in character. As the demand for places much exceeds the accommodation the authorities have considerable powers of choice, and can exclude, if they wish to, children of lower mental grade or antisocial tendencies. Obviously the more carefully the cases are chosen the better will the after-care statistics be. For this reason it is very probable that other special schools might be able to show results rather more favourable than those recorded here.

To sum up, we are here dealing with a group of educable children of school age, all of them certified by medical officers specially approved by the Board of Education to be suffering from severe epilepsy. The mental grade of these children varies from normal down to feeble-minded, and the group probably contains an undue proportion of cases liable to frequent fits or antisocial conduct.

General Results.

Of the 351 children who left our school between 1919 and 1927, 4 died at school, 3 of them of epilepsy, and 1 of pneumonia. It has been found impossible to trace 15 others, so that there remain 332 cases, upon whose after-career report can be made. The present whereabouts of these 332 cases is shown in Table I.

TABLE I.

—	Number and percentages.					
	M.		F.		Total.	
Not in Institutions.						
Self-supporting—						
No fits	27	16·1	18	17·3	45	16·6
Having fits	6		4		10	
Partly self-supporting—						
No fits	6	9·8	4	10·2	10	9·9
Having fits	14		9		23	
At day school—						
No fits	3	1·5	2	1·6	5	1·5
At home, unemployed—						
No fits	3	11·7	0	17·3	3	13·8
Having fits	21		22		43	
In Institutions.						
Inst. for epileptics	39	19·0	27	21·3	66	20·0
Poor-law or other inst. ..	15	7·3	6	4·7	21	6·3
Mental deficiency inst. ..	13	6·3	19	15·0	32	9·6
" hospitals	15	7·3	4	3·2	19	5·7
— *Died.*	43	21·0	12	9·4	55	16·6
Total	205		127		332	

Perhaps the most remarkable finding in this table is the number of deaths. The average length of time since these children left school is four and a half years, and during that period 1 in 6 of them have died; the average stay of the 351 children at school was exactly three and a half years, and during that period only 1 in 88 died. The annual death-rate per 100 among those at school was 0·3, among those who have left 3·7. In the latter group the death-rate among boys is more than twice that among girls, a fact for which it is difficult to account. If the children who have died were excluded from the table the remaining percentage differences between the sexes would be less marked. The larger proportion of girls living at home without employment is, of course, what one would expect. Where there is reason to think that the girls are of material help in the work of the house they are included in the partly self-supporting class.

The small number of children still attending day school are likely to become self-supporting in the future, and may fairly be added to that group. If this is done the table may be summarised as follows:—

	Per cent.
Wholly or partly self-supporting..	28·0
At home, unemployed	13·8
In colonies or other institutions for epileptics ..	20·0
In mental hospitals, Mental Deficiency Act Institutions, or poor-law institutions ..	21·6
Dead	16·6

Or, roughly speaking, of every 14 children who have passed through our school 4 are more or less self-supporting, 2 are at home without work, 3 are in epileptic colonies, 3 in other institutions, and 2 have died.

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[1] Annual Report of Chief Medical Officer of Board of Education, 1924, p. 79.

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Nature of Employment.

In the majority of cases the nature of the employment of those who are self-supporting has been ascertained. Thus among the males there are 8 labourers, 7 shop assistants, 5 farm workers, 4 carpenters, 4 gardeners, 3 errand boys, 2 clerks, 2 soldiers, and 1 each of the following occupations: baker, boot repairer, coalman, decorator, fur trade, golf caddie, laundryman, lino factory, milkman, motor driver, motor mechanic, hotel porter, sailor, signwriter, and stoker in the Navy. Among the females there are 11 in domestic service, 3 waitresses, and 1 each of the following: coil winder, companion, laundress, mantle maker, ornamental flower worker, shop assistant, and ticket stamper. It will be seen that the occupations are mostly pretty simple in nature, and the list is worthy of study by those who are responsible for the education and training of epileptics.

It is interesting to note that one-half of the children who have subsequently become self-supporting, never received any bromide, luminal, or other anticonvulsive medicine at Lingfield. This surely suggests that the most effective therapy for epileptics is to be found outside the medicine chest.

Marriage.—Only one case in the series, a girl, is known to be married, and so far as our information goes there is no record of illegitimate children. It must be remembered, of course, that there is no one over 25 years old in the series, and that the average present age is about 19.

Influence of Fits.

The serious handicap that fits provide in the quest for employment is sufficiently shown in Table I. This handicap is further demonstrated if the present state of the patients is shown in relation to the fit incidence before they left Lingfield. The series was divided into three groups, comprising those who had no fits in their last two years at school, those who had occasional fits (less than one major fit a month or a few momentary attacks), and those who had more frequent fits. The results are shown in percentages in Table II.

TABLE II.

—	Frequent fits (206*).	Occasional fits (66*).	No fits (60*).
	Per cent.		
Partly or wholly self-supporting	12	37	73
At home, unemployed	16	18	2
In epileptic institutions	22	24	8
In other institutions	28	12	12
Dead	22	9	5

* Cases (also in Table III.).

It will be seen that the number of fits has a profound effect both upon the death-rate and the prospect of employment.

Influence of Intelligence.

The epileptic is subject to two other serious handicaps besides his fits. First, many epileptics are difficult to get on with, or may even possess marked antisocial tendencies. Secondly, a defect of intelligence is often present. The temperamental handicap does not lend itself to measurement, but the handicap of intelligence can be fairly accurately measured by mental tests. For the last seven years every child's intelligence has been assessed annually by a Binet (Burt's London Revision) test, and an intelligence quotient (I.Q.), obtained by dividing the mental by the physical age. The relation between the intelligence quotient last obtained before each child left the school and his present state is shown in the following table (Table III.), which demonstrates that the degree of intelligence also has a profound effect on the death-rate and on the prospect of employment. The number of young adult epileptics of low grade who are living at home again calls for comment.

There is, generally speaking, a fairly close, but by no means uniform, relation between fit incidence and mental retardation, and this is evidenced by the similarity between Tables II. and III. Investigations to find out whether the age of onset of the disease had any influence upon the likelihood of an epileptic becoming self-supporting proved somewhat unexpectedly to be inconclusive. Similarly the presence of a family history of epilepsy or insanity seems to have little influence on the social outlook.

TABLE III.

—	Normal. I.Q. 90 or over (23*).	Dull and backward. I.Q. 70–89 (92*).	Feeble-minded. I.Q. 50–69 (80*).	Imbecile. I.Q. below 50 (42*).
	Per cent.			
Partly or wholly self-supporting	78	39	12·5	2
At home, unemployed ..	9	15	20	29
In epileptic institutions	4	27	26	—
In other institutions ..	—	10	27·5	45
Dead	9	9	14	24

There are 26 cases of hemiplegia in the series. These patients have a heavy additional physical handicap, and it is not surprising to find that only three of them are in the self-supporting group.

Ineducable Children.

For the most part children remain at the Colony school until they attain the age of 16. They may leave before that age for a variety of reasons. The school authorities may discharge a child, as explained above, because he is incapable of further education, and he should then be dealt with by the appropriate mental deficiency authority. As a matter of fact, out of 37 cases in the present series discharged during their school career as ineducable, less than one-third are in mental deficiency institutions. One-quarter have died, and the remainder are either at home or in some other form of institution, not one of them being able to contribute in any degree to his own support.

Promising Cases.

At the age of 16 it is the policy to discharge to their homes children whose fits are infrequent or have been arrested altogether, and whose intelligence and temperament are near enough to the normal to enable them, in our judgment, to earn a living. Sixty-three children in this series were discharged on these grounds, 55 of whom are now wholly or partly self-supporting. One has died, four are out of work, three have got back to epileptic colonies, but none are in mental hospitals, mental deficiency, or poor-law institutions. It may be claimed, therefore, that authorities in residential schools are fair judges of social efficiency.

Cases Recommended for Notification at the Age of Sixteen.

In other cases the parents are advised that a transfer should be made to one of the adult homes at Lingfield or at another colony for epileptics, or, where occasion demands it, notification to the appropriate mental deficiency authority is recommended. Unfortunately these recommendations are frequently disregarded. Parents prefer that children should return home, while certification under the Mental Deficiency Acts is not carried out, because of the deplorable lack of institutional accommodation for defective epileptics. Certification will no doubt become more common under the new Act which allows certified cases to remain at their homes under supervision, but for epileptics this is a doubtful blessing, for of all classes of certifiable or certified mental defectives, probably they stand most in need of institutional treatment. There are in this series 48 cases where notification to mental deficiency authorities was recommended at the age of 16, but less than one-third of them are in mental deficiency institutions. One-quarter have died, and the remainder are either in other forms of institution or unemployed at home, and among the 48 only one is able to contribute, and that slightly, to his own support.

Methods of Inquiry.

This investigation was carried out by inquiries addressed to the patients themselves or to their parents in the first instance. Failing a reply from this source application was made to local education or poor-law authorities, who, in many cases, were good enough to go to considerable trouble to follow up the children. The reading of the letters and reports brings one into very close touch with the life of epileptics and their relation to the community. The presence of an epileptic in a home often means unhappiness to the family. Many letters testify to this, and go to show the inadequacy of our present arrangements for meeting the need. Extracts from two letters and a report may be quoted here. The letters refer to children who had been discharged from Lingfield as incapable of further education.

"I am sorry to say she is getting worse every day and very violent in her temper, she has got me. also her father bruised and scratched and pieces took out of us. She is really getting too much for us. We have tried everything to see if she could alter her fit of passion, but we can't, so our doctor said she will have to go away because my health is getting too bad. They took her to our mental hospital on Xmas Eve but brought her back, she wasn't bad enough for there."

"… his mental condition is much worse, also the fits about 40 or 50 a month, he is in bed days at a time, he is at home with us, we have tried at quite a number of homes for such cases but we have not been able to get him in anywhere, as I have four other children he is getting past my management as he has grown quite a big boy."

The report is of an intelligent girl, who at her nother's request left here at the age of 16. When her nother realised her mistake she was advised to apply o the local guardians to place the girl in a home for pileptics.

"After the girl came home from Lingfield the mother plied to the Guardians but they placed her in a ward h blind senile old women and she was so unhappy that she was taken home again after a few days. Her mother refused to consider the idea of reapplying, but there does not seem any other means of solving the difficulty."

Such letters and reports are not at all uncommon in this series.

Conclusions.

This investigation shows that the death-rate rises very rapidly after children have left a residential school for epileptics. Rather more than one-quarter become wholly or partly self-supporting, and this group contains a large proportion of those whose intelligence was high and fit incidence low at the time they left the colony. About 1 in 7 of the cases are living at home without employment of any kind. Most of these would be better cared for in institutions, and many of them, especially the lower-grade cases, are urgently in need of institutional care.

Over 40 per cent. are in institutions. Most of those in poor-law institutions would probably be more suitably placed either in epileptic colonies or in mental deficiency institutions. Doubtless some of the lower grade cases in epileptic colonies should be dealt with under the Mental Deficiency Acts were suitable accommodation available for them.

Epilepsy is usually a lifelong disease, which carries with it marked social handicaps. Its victims, in our country, run into many thousands. Few would be found now to endorse the teaching of Gowers that epilepsy is one of the diseases most amenable to treatment by drugs. Both before and since the time of Gowers there has been much laborious research into the causation and nature of the complaint, but with little definite outcome. Failing advances in therapy, empirical or based on more extended knowledge of the underlying pathology of epilepsy, it behoves us to inquire what is the social treatment meted out to the various classes of epileptics, and along what lines they can be most happily and effectively dealt with. To such an inquiry the present paper is intended to be a small contribution.

Clinical and Laboratory Notes.

A FATAL CASE OF POST-VACCINAL ENCEPHALITIS.

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AND
R. Oddie, B.M., B.Ch. Oxf.,
HOUSE PHYSICIAN TO THE HOSPITAL.

In the case under review the exact relationship of the fatal illness to the preceding vaccination is very obscure. Other cases have been observed and are being investigated, but this one is recorded now since it shows unusual features of special interest. We use the term encephalitis for convenience rather than in any narrow specific sense.

History of the Case.

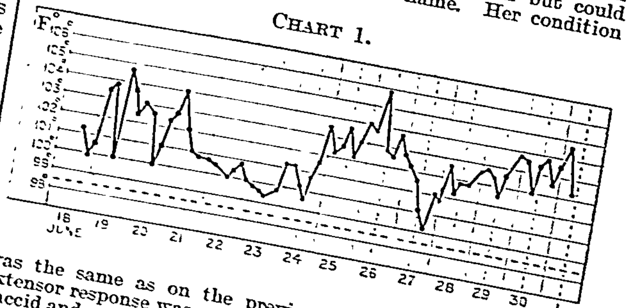
S. C., female, aged 9 years. Admitted to St. Thomas's Hospital June 18th, 1928. Died July 1st.

Apart from an attack of chicken-pox at the age of 7 years, this child's previous history was unimportant. She had not been previously vaccinated. Vaccination was performed by Dr. C. J. E. Edmonds on June 5th, and took a normal course. On June 12th she was sent home from school on account of headache and dizziness and she vomited once. The headache persisted, she became drowsy, and on the 15th vomited. Thereafter she was confined to bed. On the 16th her condition was unchanged, but the temperature rose to 102·5° F. and she vomited again. On the 17th her temperature rose to 105° F. Retention of urine occurred for the first time, and from that day onwards regular catheterisation was required.

She was seen by one of us (A. E. R.) on June 17th. She was then practically unconscious with a flushed face, pulse 128, pupils small and reacting to light. She could not be made to talk, but did put out her tongue when asked. Pharynx, heart, lungs, and abdomen were normal. Both knee-jerks were absent but there was an extensor response in the right big toe. The abdominal reflexes were absent. There was no retraction of neck and no rigidity of neck muscles. Temperature at 11 P.M. was 103° F.

Condition on Admission.—She was admitted into the hospital on the following day, June 18th. Chart 1 gives a record of her temperature up to the time of her death. She was practically unconscious on admission but could just be roused and did murmur her name. Her condition was the same as on the previous day, although now an extensor response was present on both sides. Her legs were flaccid and painful stimulation only evoked slight contraction of extensor muscles of thighs. Arms were slightly spastic and responded more readily to stimulation. Her eyes were half closed. No paralysis of ocular muscles was observed and the optic discs were normal. Tongue furred. Her pulse was rapid throughout, generally speaking between 120 and 140. Respirations varied from 24 to 40. No changes developed in the cardiovascular system, lungs, and gastro-intestinal system.

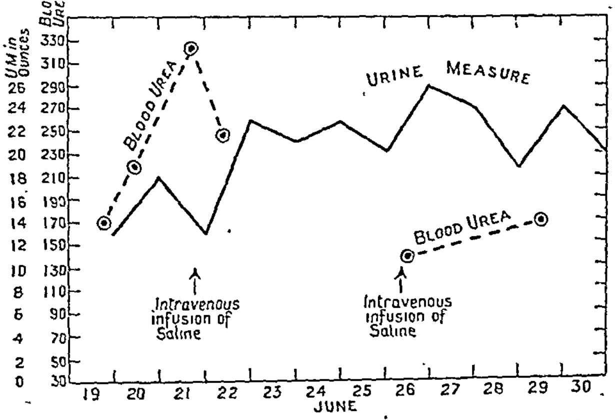
CHART 1.



She remained in practically the same condition until her death. At the best she was profoundly lethargic when not absolutely comatose. At times, however, a slight glimmer of consciousness did return. She appeared, for instance, to recognise her parents and murmured "mother," and one day asked for a drink. Her position hardly varied from day to day. She never moved her legs at all and they were quite flaccid throughout. Her arms were slightly spastic, the left more so than the right. They were, as a rule, pressed across her chest, but if they were displaced she would slowly bring them back. Only on one or two occasions was there any indication of voluntary movement of arms Her head was usually slightly inclined to the left, but there was no conjugate deviation of eyeballs. If the head were displaced to the right it would in time make its way back to the left. At times there seemed slight rigidity of the neck muscles. Her eyes were never closed, leaving a gap of about an eighth of an inch, which was probably the cause of a slight corneal ulceration. Independent movements of eyeballs took place. The child lost flesh, but did not become emaciated, weighing 42 lb. at death. The urine was free from albumin on admission, but a trace appeared after a few days and a few pus cells were observed. Leucocyte count 5400.

Lumbar puncture was performed on June 19th, 27th, and 30th; there was no increase of pressure and the fluid was quite transparent. Its urea content was very high, 180 mg. per cent. Owing to the fact that in some cases a high blood-urea had been recorded, this was investigated on June 19th, although the urine was then free from albumin. The urea was found to amount to 170 mg. per cent. Six estimations of the blood-urea were made by one of us (R. O.), and the records are shown in Chart 2, which also shows the daily volume of urine excreted. In view of the high urea concentration an intravenous infusion of 1 pint of saline was given on June 21st, and again on June 25th, with temporary benefit. Rectal injections of normal saline were administered every eight hours, but these had to be discontinued after three days, as they were not retained. The percentage of urea in the urine was 3·5 on June 21st and 4 per cent. two days before death. No casts were present with the exception of an occasional granular cast at the end, together with a little pus. *B. coli* was grown from the urine on July 2nd.

CHART 2.



On admission, the inner side of both knees presented a reddish spot about the size of a sixpence, and over the lower end of each tibia there was also present an elongated patch of redness about 1½ in. in length by ¼ in. in width. These patches were surrounded by a sharply defined white areola. Within a day or two of her admission a blister slowly developed on three of these patches. From their position these were explainable as the result of pressure, those on the knees being situated exactly where the knees come into contact when the legs are lying side by side and those lower down where the legs naturally cross each other.

Treatment.—As it was almost impossible to get her to swallow anything, the child was fed throughout by the nasal tube. She was put on hexamine grs. v. three times daily for ten days. She was also given an injection of 0·3 g. of stabilarsan on the day of admission.

The *post-mortem examination* was performed by Dr. J. F. Taylor, who contributes the following notes:—

The brain showed no definite increase of cerebro-spinal fluid. The fluid was clear and no meningitis was present. The convolutions were normally defined. General congestion of surface vessels was noticeable, rather more marked at the base. Sections through all parts of the hemispheres, mid-brain, cerebellum, &c., showed congestion but no hæmorrhages. No areas of softening were to be detected. The spinal cord presented a similar appearance.

The kidneys weighed 4¼ oz. They were congested; the capsules stripped readily, and there was no obvious inflammation. The bladder contained turbid urine and showed signs of recent cystitis. Nothing abnormal was detected in the remaining organs and the vaccination scabs were normal. Microscopical examination was made of portions of cortex, basal ganglia, crura cerebri, pons, medulla, cervical and lumbar cord—with almost negative results. A moderate congestion was found, but no perivascular or diffuse infiltration. No hæmorrhages, thromboses, or other pathological changes were observed. The condition of the kidneys was interesting, though evidence of definite nephritis was very scanty. The glomeruli were slightly swollen and showed a multiplication of nuclei, and there was some cloudiness and swelling of the tubular epithelium. A curious feature was the deposition of minute collections of calcium salts in many of the convoluted tubules.

Remarks.

Two other children in the family were vaccinated at the same time as this one. A sister did not take, but a brother went through a mild illness from which he has made a good recovery. He was vaccinated on the same day, June 5th, and on June 14th and for several days afterwards, he was out-of-sorts, feverish, and drowsy, with occasional vomiting, symptoms which it is not unreasonable to suppose represented a mild attack of the same illness from which the patient died.

1. The patient suffered from a short febrile illness, the earliest symptoms of which appeared on June 12th, seven days after vaccination, and death occurred on July 1st after an illness of 19 days.

2. The main symptoms were indicative of a profound disturbance of the nervous system. The striking clinical feature of the case was the profound lethargy, and we would emphasise the remarkable immobility of this child throughout her whole illness. Seen day after day, she lay in exactly the same position, with the same slightly flushed cheek and slightly open eyes, giving no indication of life whatever other than her faint respiratory movements. She never moved her legs at all, and her arms were almost as motionless. Lethargy is, of course, a well-known feature in some cases of encephalitis, but the profound immobility of this child was very striking.

3. The scanty pathological changes in the brain and spinal cord are noteworthy. The post-mortem examination revealed nothing more—both to naked eye and microscopical examination—than general congestion.

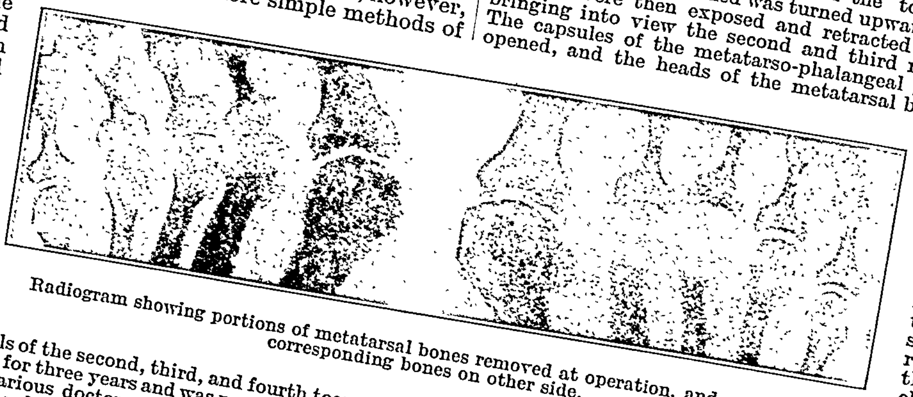
4. Marked urea retention. The blood-urea was 170 mg. per cent. at the first estimation; it rose as high as 318 on June 21st, and three days before death it amounted to 170. The cerebro-spinal fluid also showed a high percentage of urea, 180 mg. per cent. on June 19th. This marked retention of urea, together with profound coma, naturally suggested uræmia, but the percentage of urea in the urine on two estimations amounted to 3·5 and 4 per cent., and at the beginning the urine was absolutely free from albumin, nor was there at any time more albumin than could be accounted for by the mild cystitis. Dr. Taylor's report on the microscopical condition of the kidneys shows, moreover, an absence of any real nephritis. The high urea percentage may, therefore, arise in some manner hitherto unsuspected. We conferred with Dr. O. L. de Wesselow on this point, and he suggested that it might be due to desiccation of the child, coupled, perhaps, with increased metabolism. Some loss of flesh certainly took place, but death occurred before any real emaciation. This high concentration of urea in the blood has been noted in other cases, but it would appear from ours that it may occur without any convincing evidence of nephritis.

The absence of any gross changes in the brain characteristic of encephalitis may, on the other hand, lend support to the view that the symptoms were more allied to those of uræmia, and due to a failure on the part of the kidneys to fulfil their functions, despite the absence of gross evidence of nephritis. Further observations on similar cases may throw light on this curious feature.

A CASE OF PERSISTENT METATARSALGIA TREATED BY OPERATIVE MEASURES.

By R. Brooke, M.B. Lond., F.R.C.S. Eng.,
HON. ORTHOPÆDIC SURGEON TO THE ROYAL WEST SUSSEX HOSPITAL.

True Morton's metatarsalgia with dropping of the anterior arch of the foot can be treated very satisfactorily and with good results by the usual orthopædic corrective appliances. Now and again, however, cases do not respond to these more simple methods of treatment. An example is detailed below, with the method used to overcome the deformity.



Radiogram showing portions of metatarsal bones removed at operation, and condition of corresponding bones on other side.

An unmarried woman, aged 42 years, gave a history of pain, neuralgic in type, on the dorsum of both feet and in the balls of the second, third, and fourth toes. The pain had persisted for three years and was progressive, in spite of treatment by various doctors who had supplied her with metatarsal bars to her boots and various forms of arch supports. On examination the patient—a not unduly heavy or fat woman—was found to have marked bilateral dropping of the anterior arches with hallux valgus. There was some tenderness on pressure on the under-surface of the balls of the second, third, and fourth toes, more marked in the right foot than the left. Both feet were quite soft and supple and X ray examination revealed no arthritic changes. She was measured for, and supplied by an instrument maker with, a pair of boots of the correct size and a pair of transverse arch supports. Supplementary treatment consisted of massage, radiant heat applications, and foot drill three times a week.

At the end of two months the condition was unimproved. In fact, her feet were if anything rather worse than they were before. It was therefore decided to operate. Using Esmarch's bandages and a tourniquet, the operation was practically bloodless. A small semilunar incision was made on the dorsum of the right foot (the worse foot) half an inch proximal to the junction of the toes with the foot. The skin flap thus formed was turned upwards. The extensor tendons were then exposed and retracted out of the way, bringing into view the second and third metatarsal bones. The capsules of the metatarso-phalangeal joints were then opened, and the heads of the metatarsal bones, freed from surrounding structures, were removed by cutting through the shafts proximal to the heads with bone-cutting forceps. The tendons were subsequently replaced and the wound closed. The operation took only a few minutes. Ten days later the patient was walking about in comfort with transverse arch supports in her boots and without a stick. At the present time, three months after operation, the right foot is entirely free from pain, and she is asking that the other foot should be similarly treated.

Although in this operation the transverse arch of the foot was permanently weakened, the end-results seem to have justified the means taken. The small amount of arch which the patient had before the operation is now more than reconstituted by the mechanical arch support which she is wearing, and—what is more important—she is free from pain.

DIPHTHERIA AND THE "PROTECTIVE" POWER OF SERUM.

By John Gordon, M.D. Leeds, D.P.H.,
and
Jack Science, M.D. Leeds, D.P.H.
(From the Department of Pathology and Bacteriology, University of Leeds, and the City Infectious Diseases Hospital, Seacroft.)

In a previous paper[1] describing a study of 25 cases we showed that serum from patients suffering from diphtheria may be deficient in the property of protecting red blood corpuscles from the hæmolytic action of sodium ricinoleate, a property normally present in human serum. The marked hæmolytic action of sodium ricinoleate on red cells is markedly diminished on addition of serum, and this action (protective action) of serum has been attributed by E. Ponder[2] to the protein components of serum. It was shown that this protective power returned in simple uncomplicated cases of diphtheria by the end of the third week. While in a few cases of diphtheria with developing paralysis there was no marked interference with the protective power of the serum, in most cases of diphtheria where paralysis occurred this diminished protective power lasted for some time and even up to 80 days, and it was suggested that the protective power of the serum of a patient with diphtheria should be tested against a hæmolysin at different stages of the disease, and compared with a normal serum with a view to assisting prognosis with regard to the possible development of paralysis.

In this paper a further series of 50 cases of diphtheria were examined with a view to confirming and extending the previous observations. The experimental details were the same as in the previous paper.

The patients were bled from the arm and the serum separated. The serum was tested as soon as possible on the same day, being kept in the refrigerator till required. The test was carried out in the following way: to each of three narrow tubes were added 0·5 c.cm. of the patient's serum, and to three other tubes 0·5 c.cm. of a healthy person's serum. To tube 1 was added 0·1 c.cm. of a 1 per cent. solution of sodium ricinoleate in normal saline; to tube 2, 0·2 c.cm.; and to tube 3 was added 0·3 c.cm. The mixtures were shaken and allowed to stand at room temperature for half an hour. Then 0·2 c.cm., 0·1 c.cm., and 0·05 c.cm. were taken from each tube and added to 0·5 c.cm. of a 3 per cent. suspension of washed ox blood cells. These were put in the incubator at 37° C. for one hour, and then the varying degrees of hæmolysis were read.

Amount of 1 per cent. sodium ricinoleate added to 0·5 c.cm. serum.

—	0·1 c.cm.			0·2 c.cm.			0·3 c.cm.		
	c.cm. of mixture.								
	0·2	0·1	0·05	0·2	0·1	0·05	0·2	0·1	0·05
Patient's serum	††	–	–	†††	†	–	††††	†††	–
Control serum	–	–	–	–	–	–	†	–	–

†††† = complete hæmolysis. ††† = almost complete hæmolysis.
†† = partial hæmolysis. † = trace of hæmolysis.
– = no hæmolysis.

The patient's serum showed marked lack of protection.

An example of the reading obtained from a case of diphtheria that developed palate and ocular paralysis is here given. The blood was taken on the twenty-fifth day of the illness.

Fifty consecutive cases of diphtheria were tested, including cases of moderate and severe throat lesions,

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[1] Quart. Jour. Med., 1928, xxi., 345.

[2] Ponder, E.: Proc. Roy. Soc. B. London, 1923, xcv., 42; Ibid., London, 1925, xcviii., 481.

Of these 39, or 78 per cent., showed complete protection by the second to the third week, and these cases did not develop paralysis. Of the remaining 11 who showed lack of protection prolonged beyond the third week, 8 developed paralysis. In one of the cases developing paralysis, lack of protection continued up to five weeks after the onset of the disease.

This series of cases, taken in conjunction with the 25 already described, indicate that a knowledge of the protective power of the serum about the third week might be useful in assessing the possible development of paralysis in a case of diphtheria, from which the ordinary clinical symptoms have already disappeared, the probability being that this lack of protection of the serum is in some way related to the action of the diphtheria toxin.

Public Health Services.

LIVERPOOL PORT SANITARY AUTHORITY.

In his report for 1927 Dr. A. A. Mussen mentions 5644 visits of inspection paid to ships, of which 948 (930 last year) had nuisances on board; there were 3297 (3099) dirty forecastles and 409 (254) foul water-closets. The men are being more considered; the Board of Trade, the Port Sanitary Authority, the unions, the shipping companies, all coöperating. Quarters are being put at the after-end of ships, cubic space is being increased, bunks are better, vermin-proofing better, washing places more usual, hospital accommodation more frequent, and, thanks in large measure to the Board of Trade, food is much better. But plans of new ships should be approved by authority, and when as much attention is given to the health of seamen as to that of any other section of the community, standards of accommodation will be international. Cleanliness of crew spaces depends on discipline and should be examined daily. Of 38 cases of enteric fever mentioned as occurring in voyages that brought ships to Liverpool, 34 were in seamen; of 18 cases of dysentery 12 were among the crews, 1 was a military passenger, the other 5 were "distressed British subjects." Of tubercle 39 cases were landed (origin unstated) this year, and two cases of encephalitis lethargica. No cases of plague, cholera, or yellow fever were landed. The prevalence of these diseases through the world in 1925–27 is stated with a most interesting map. Plague was an anxiety in 1927 in the Indian Ocean, Levant, West Africa, and South America; cholera in the Indian and China seas; yellow fever in West Africa, Rio, and there were single cases reported in Bangkok and Rangoon, a very important matter if the diagnoses were beyond cavil. Plague is being constantly watched for; the docks are made as nearly rat-proof as possible, ships from suspected ports are searched for rats; 6781 rats from ships and quays were pathologically examined and all were plague-free.

The seamen's dispensary served more patients in 1927, fresh cases 1842 (1360), total attendances 55,063 (41,720); evening clinics are now held twice a week. Cures are reported, 421, "an improvement of 80 per cent."; as last year, of every 10 cases 6 were gonorrhœa, 3 syphilis, and 1 soft chancre, but gonorrhœa cases are apt to delay attending till they have become chronic; 20 per cent. of the syphilis cases are in the pre-Wassermann stage. Of 20,121 alien arrivals examined to see if they have any disease dangerous to the public health or likely to cause a public charge, 6 were certified, 3 for venereal disease, 2 for mental deficiency, 1 for phthisis. Medical officers of the Board of Trade inspect all emigrants, second class or steerage, and crews of vessels bound for America. There were 123,801 emigrants and 16 were rejected for infectious disease. Of 80 cases of trachoma or conjunctivitis 77 sailed later; 3 returned home.

The recent regulations in regard to preservatives in food and imported food seem to work well, for there are no complaints of difficulty. Far less unsound food had to be condemned and "utilised under supervision" this year, 2621 (5482) tons, although the amount is still enormous. Everything is done to ensure that the functions of the port medical officer shall be effectively discharged with the least possible delay to ships. Now that, owing to the opening of the new Gladstone Dock, vessels can enter the docks at all states of the tide, a medical officer is on duty day and night to deal at once with infectious diseases. Ships from infected ports can be promptly dealt with, as the authority has a new motor launch with a speed of 11½ knots, and good accommodation for crew, a medical officer, and four patients on the way to hospital. It is named the *Moyles*, after Dr. J. G. Moyles, who has long been the chairman of the port authority.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the 1927 statistics of two Scottish and five English towns:—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population. All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Death-rates per 1000 births. Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Edinburgh C. .. (425,147)	17·9	14·3	1·20	1·68	2·4	1·8	80/33	5·5	6·9
Paisley B. .. (87,010)	20·6	13·1	0·99	1·33	2·3	1·9	90/44	7·2	5·5
East Ham C.B... (146,900)	15·8	9·7	0·93	1·19	2·0	1·5	53/—	3·4	5·2
Coventry C. .. (129,500)	15·9	10·9	1·07	1·20	2·2	1·1	63/37	4·3	4·8
Halifax C.B. .. (96,270)	13·8	16·4	1·00	1·64	3·1	2·6	90/51	6·7	7·5
Great Yarmouth C.B. (58,500)	16·0	13·6	1·11	1·45	2·1	1·8	62/31	3·2	1·1
Dover B. .. .. (39,530)	18·7	12·4	1·29	1·59	2·8	1·7	44/18	2·6	3·8

C=City. C.B.=County borough. B=Burgh or Borough.
— = No information.

Edinburgh.

Dr. William Robertson, referring to the reduction in infant mortality, says improved housing conditions ought to save many more lives of children. Four whole-time lady clinical medical officers have been appointed in order to get into more intimate and personal touch with the mothers in the various districts of the city. An effort is also being made to provide instruction in cookery and the preparation of nourishing meals with rudimentary apparatus. The fact that there must be a delay in the provision of good houses is felt to be no reason for the delay in the provision of good food. A beginning has been made with the St. Leonard's slum clearance area, and the dispossessed tenants will have accommodation provided on the Prestonfield housing site. The contrast between the old and the new housing conditions is well illustrated by photographs of St. Leonard's ward and of a model of the lay-out of the Prestonfield housing scheme. The hugeness of the Edinburgh housing problem is brought out by the fact that out of 104,488 inhabited houses there are 7328 single-room habitations and that there are approximately 12,000 houses with rentals below £10 and 22,922 with rentals between £10 and £15. This means that many tenants accustomed to pay small rents have to be induced to pay higher rents. Dr. Robertson emphasises the relationship between an excessive death-rate from tuberculosis and the prevalence of the bad type of house in certain of the wards.

During the year out of 219 deaths caused by epidemic diseases 114 were due to whooping-cough and measles, and here again the new housing methods, taking the place of old town properties, consisting of 10, 12, or even more houses branching off each common stair, ought to gradually produce a great result. The immunisation scheme against diphtheria makes good progress. There has not been one bad result and in the overwhelming majority of children the injection never causes a moment's discomfort. Among 11,608 children, 7608 of whom were immunised and 4000 of whom were Schick-negative, there occurred 58 cases of diphtheria. but not a single death. During the four years 1924 to 1927 there were 2741 notifications of diphtheria with 242 deaths. Full particulars are given in the report of the circumstances under which the 58 mild cases of diphtheria occurred among the immunised or partially immunised children.

Dr. Robertson expresses his regret that the House of Commons rejected the Edinburgh proposal to enforce the treatment of sufferers from venereal diseases. The patients who ceased treatment before being cured numbered 985 during 1927, giving a percentage of defaulters to the total cases treated of 13·8—somewhat higher than in the previous year. The Scottish Board of Health estimates the percentage of default by the ratio of defaulters to the total cases leaving the centres for any reason and by this method the percentage of default in Edinburgh was 32. Every effort is made to follow up patients, by letters in the case of males and by visits from an almoner in the case of females. The almoners' task is a thankless one as frequently. after several visits. she secures the return of a patient for treatment to be followed again by a subsequent default.

Tribute is paid to the valuable work done by volunteers in connexion with the maternity and child welfare scheme. Dr. Robertson makes special reference to the five childs' gardens which are subsidised by the corporation and to the nurseries, which are provided to enable the mothers to attend the cookery demonstrations. A special investigation of shaving-brushes has shown that such brushes may be infected with a bacillus resembling the bacillus of anthrax. Attention has also been given to improving the technique of the virulence test of the diphtheria bacillus, and it is claimed that an intracutaneous test gives a satisfactory and more rapid result.

The cows stalled in the city number 3732, and during the year 26 were dealt with under the Tuberculosis Order. Of these 15 had tubercle of the udder, tuberculous emaciation, and 8 a chronic cough with other evidence. In 10 cases the udder infection was diagnosed by microscopical examination, and in 5 more by the biological test. In addition to these 26 18 cows came under suspicion as the result of the routine examinations. These animals did not come within the scope of the Tuberculosis Order, but the owners were persuaded to remove them from the dairy herds. The incidence of tuberculosis among the dairy cows of the district, as judged by post-mortem results at the abattoirs. showed no material change when compared with former years; out of 1585 cows slaughtered 43 per cent. were affected with tubercle. The tubercle-free herd of about 50 cows run in connexion with the Royal Victoria Hospital had no reactors at the half-yearly testings. The samples of outside milk examined for tuberculous infection numbered 122, and 7 of these gave a positive result.

Paisley.

Dr. G. V. T. McMichael estimates the houses required at the end of 1927 at 947. The municipal houses sanctioned by the Board of Health number 2010. of which 1306 have been completed and occupied. Despite the encouraging progress made with housing schemes the clamant problem of the slum dwellers, who cannot afford to pay the rents of corporation houses, has not been faced. Dr. McMichael suggests for these two- and three-roomed houses built in three-storied tenement blocks and of the simplest possible character. He definitely opposes the erection of any one-roomed houses, of which there are already too many. It is. in fact. the high proportion of one- and two-roomed houses which makes the domiciliary treatment of the respiratory diseases, including tuberculosis, so difficult in Paisley. During 1927 412 cases of acute primary and influenzal pneumonia were treated in the three hospitals. The case fatality in the fever hospital was 15·6 per cent. and in the Royal Alexandra Infirmary 13·5 per cent.; whilst among the 149 cases treated at home the case mortality was 34·2 per cent. The new probationers at the fever hospital are subjected to the Dick and Schick tests and immunised if necessary.

The Russell Institute, opened in March by H.R.H. Princess Mary, provides in an up-to-date manner for the various municipal health services, including artificial sunlight, X rays, a dental and a remedial exercise clinic. The public has shown an extraordinary interest in the institution and 10,000 people passed through it on the one day when it was opened for inspection. Dr. McMichael is enthusiastic as to the result of light treatment both for rickets and practically all types of surgical tuberculosis, though he is much disappointed at the irregular attendance of the mothers, whose children suffer from rickets. The antenatal work makes good progress and is largely helped by the beds available for antenatal cases at Barshaw Hospital. During 1927 525 mothers attended the antenatal clinics and 206 antenatal cases were admitted to Barshaw Hospital. The total births numbered 1791.

East Ham.

Dr. W. Benton refers to the inadequacy of the isolation hospital. As far back as 1914 this matter was considered and plans were prepared and submitted to the Ministry, but the outbreak of war stopped further progress. In 1922 the Ministry made certain suggestions for temporary improvements and for the preparation of a complete scheme to be carried out in stages as circumstances permitted. Much of the accommodation is of a temporary nature—e.g.. military huts. According to the usual standard per 1000 of the population there should be 150 beds, whereas without overcrowding there are only 100. The report shows that at present there is overcrowding to the extent of 40 beds. During 1927 epidemic prevalence of diphtheria and scarlet fever put pressure on the hospital. Over 10 per cent. of the scarlet fever cases admitted were also infected with diphtheria. Scarlet fever antitoxin was used for 20 patients with severe septic and toxic symptoms and, with one exception, the results were highly satisfactory. The persistence of nasal. pharyngeal, and aural complications has given trouble. There is the usual complaint of delay in giving antitoxin for diphtheria. The average duration of illness of 27 fatal cases prior to admission to hospital was four days, and the successful use of antitoxin at this stage is hopeless. Towards the end of the year diphtheria assumed an unusually septic and toxic type. Of the 30 fatal cases of diphtheria 23 of the deaths occurred under 8 years of age. Six members of the staff contracted diphtheria and two scarlet fever. Prophylactic immunisation has not yet been adopted.

The staff of health visitors has been brought up to the level of five years ago by the belated filling of a vacancy, but Dr. Benton points out that a further increase of staff is needed in order to cope with the supervision of the pre-school child. He summarises the needs of East Ham children as follows: (1) A more intensive health campaign with regard to the pre-school child (already good work is being done for these children at the aural, dental, and ophthalmic clinics). (2) Practical and interesting instruction in hygiene in the elementary schools. (3) The erection of a day open-air school to accommodate 500 children. (4) The provision of a special school to accommodate 200 physically defective children. (5) The improvement of home conditions, especially in the direction of reducing overcrowding.

Coventry.

Dr. E. H. Snell mentions that during the latter half of the year there were two sharp outbreaks of diphtheria, each associated with a large school. In a

Of these 39, or 78 per cent., showed complete protection by the second to the third week, and these cases did not develop paralysis. Of the remaining 11 who showed lack of protection prolonged beyond the third week, 8 developed paralysis. In one of the cases developing paralysis, lack of protection continued up to five weeks after the onset of the disease.

This series of cases, taken in conjunction with the 25 already described, indicate that a knowledge of the protective power of the serum about the third week might be useful in assessing the possible development of paralysis in a case of diphtheria, from which the ordinary clinical symptoms have already disappeared, the probability being that this lack of protection of the serum is in some way related to the action of the diphtheria toxin.

Public Health Services.

LIVERPOOL PORT SANITARY AUTHORITY.

In his report for 1927 Dr. A. A. Mussen mentions 5644 visits of inspection paid to ships, of which 948 (930 last year) had nuisances on board; there were 3297 (3099) dirty forecastles and 409 (254) foul water-closets. The men are being more considered; the Board of Trade, the Port Sanitary Authority, the unions, the shipping companies, all coöperating. Quarters are being put at the after-end of ships, cubic space is being increased, bunks are better, vermin-proofing better, washing places more usual, hospital accommodation more frequent, and, thanks in large measure to the Board of Trade, food is much better. But plans of new ships should be approved by authority, and when as much attention is given to the health of seamen as to that of any other section of the community, standards of accommodation will be international. Cleanliness of crew spaces depends on discipline and should be examined daily. Of 38 cases of enteric fever mentioned as occurring in voyages that brought ships to Liverpool, 34 were in seamen; of 18 cases of dysentery 12 were among the crews, 1 was a military passenger, the other 5 were "distressed British subjects." Of tubercle 39 cases were landed (origin unstated) this year, and two cases of encephalitis lethargica. No cases of plague, cholera, or yellow fever were landed. The prevalence of these diseases through the world in 1925–27 is stated with a most interesting map. Plague was an anxiety in 1927 in the Indian Ocean, Levant, West Africa, and South America; cholera in the Indian and China seas; yellow fever in West Africa, Rio, and there were single cases reported in Bangkok and Rangoon, a very important matter if the diagnoses were beyond cavil. Plague is being constantly watched for; the docks are made as nearly rat-proof as possible, ships from suspected ports are searched for rats; 6781 rats from ships and quays were pathologically examined and all were plague-free.

The seamen's dispensary served more patients in 1927, fresh cases 1842 (1360), total attendances 55,063 (41,720); evening clinics are now held twice a week. Cures are reported, 421, "an improvement of 80 per cent."; as last year, of every 10 cases 6 were gonorrhœa, 3 syphilis, and 1 soft chancre, but gonorrhœa cases are apt to delay attending till they have become chronic; 20 per cent. of the syphilis cases are in the pre-Wassermann stage. Of 20,121 alien arrivals examined to see if they have any disease dangerous to the public health or likely to cause a public charge, 6 were certified, 3 for venereal disease, 2 for mental deficiency, 1 for phthisis. Medical officers of the Board of Trade inspect all emigrants, second class or steerage, and crews of vessels bound for America. There were 123,801 emigrants and 16 were rejected for infectious disease. Of 80 cases of trachoma or conjunctivitis 77 sailed later; 3 returned home.

The recent regulations in regard to preservatives in food and imported food seem to work well, for there are no complaints of difficulty. Far less unsound food had to be condemned and "utilised under supervision" this year, 2621 (5482) tons, although the amount is still enormous. Everything is done to ensure that the functions of the port medical officer shall be effectively discharged with the least possible delay to ships. Now that, owing to the opening of the new Gladstone Dock, vessels can enter the docks at all states of the tide, a medical officer is on duty day and night to deal at once with infectious diseases. Ships from infected ports can be promptly dealt with, as the authority has a new motor launch with a speed of 11½ knots, and good accommodation for crew, a medical officer, and four patients on the way to hospital. It is named the *Moyles*, after Dr. J. G. Moyles, who has long been the chairman of the port authority.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the 1927 statistics of two Scottish and five English towns:—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Edinburgh C. .. (425,147)	17·9	14·3	1·20	1·68	2·4	1·8	80/33	5·5	6·9
Paisley B. .. (87,010)	20·6	13·1	0·99	1·33	2·3	1·9	90/44	7·2	5·5
East Ham C.B... (146,900)	15·8	9·7	0·93	1·19	2·0	1·5	53/—	3·4	5·2
Coventry C. .. (129,500)	15·9	10·9	1·07	1·20	2·2	1·1	63/37	4·3	4·8
Halifax C.B. .. (96,270)	13·8	16·4	1·00	1·64	3·1	2·6	90/51	6·7	7·5
Great Yarmouth C.B. (58,500)	16·0	13·6	1·11	1·45	2·1	1·8	62/31	3·2	1·1
Dover B. .. .. (39,530)	18·7	12·4	1·29	1·59	2·8	1·7	44/18	2·6	3·8

C = City. C.B. = County borough. B = Burgh or Borough. — = No information.

Edinburgh.

Dr. William Robertson, referring to the reduction in infant mortality, says improved housing conditions ought to save many more lives of children. Four whole-time lady clinical medical officers have been appointed in order to get into more intimate and personal touch with the mothers in the various districts of the city. An effort is also being made to provide instruction in cookery and the preparation of nourishing meals with rudimentary apparatus. The fact that there must be a delay in the provision of good houses is felt to be no reason for the delay in the provision of good food. A beginning has been made with the St. Leonard's slum clearance area, and the dispossessed tenants will have accommodation provided on the Prestonfield housing site. The contrast between the old and the new housing conditions is well illustrated by photographs of St. Leonard's ward and of a model of the lay-out of the Prestonfield housing scheme. The hugeness of the Edinburgh housing problem is brought out by the fact that out of 104,488 inhabited houses there are 7328 single-room habitations and that there are approximately 12,000 houses with rentals below £10 and 22,922 with rentals between £10 and £15. This means that many tenants accustomed to pay small rents have to be induced to pay higher rents. Dr. Robertson emphasises the relationship between an excessive death-rate from tuberculosis and the prevalence of the bad type of house in certain of the wards.

During the year out of 219 deaths caused by epidemic diseases 114 were due to whooping-cough and measles, and here again the new housing methods, shock therapy, and in some cases their mental trouble was cut short by this means. Eight cases of general paralysis were treated by induced malaria; 3 were discharged "recovered," and 2 others improved. 65·5 per cent. of patients were usefully employed, the majority in the grounds, laundry, kitchen, and sewing-room. Electric light is to be installed throughout the building. There is some difficulty in keeping the number of female nurses up to establishment.

At *Rubery Hill and Hollymoor Mental Hospital* there were 1815 patients at the end of the year, including 146 epileptics. Of the admissions during 1927 nearly 15 per cent. were cases of general paralysis in an advanced and debilitated condition. The recovery-rate of 48·1 per cent. is therefore all the more encouraging. Over 64 per cent. of all cases admitted were totally discharged. The completion of a special treatment block, including an operating theatre and electrical and hydrotherapy rooms, has provided a most valuable adjunct to the care of the patients. Two bungalows are used as convalescent wards for women and a third will be available when a nurses' home is built. The general health of the patients was good, and only three cases of tuberculosis were under treatment at the end of the year. There was no typhoid fever; this may be partly due to the liberal use made of T.A.B. vaccine as a means of inducing protein shock. A routine test for intestinal organisms on admission showed that 25 per cent. of patients had had at some time a more or less severe intestinal infection. Some of these become carriers and originate outbreaks of dysentery or colitis in the institution. The medical superintendent makes the interesting observation that the deeper problems of mental disorder are also those of rheumatism and rheumatic disorder—states of low grade and chronic infectivity. The hydrotherapeutic department has therefore been augmented by four tables for continuous colon irrigation and two mercury-vapour lamps. The malarial treatment of general paralysis has been largely superseded by other forms of induced pyrexia, especially non-specific protein therapy. To the stress laid on removal of focal sepsis the Visiting Commissioners attribute the striking absence of noise and unrest among the patients; the removal of somatic irritation takes the place of sedatives. Parole on and off the estate is granted to over 200 patients, and most of those discharged are previously sent out on trial. Nearly 1000 patients are employed at trades or on the estate. Twenty-three male and 12 female nurses have passed the final examination for the M.P.A. certificate, 5 with distinction.

The *City of Cardiff Mental Hospital*, like the hospitals of Birmingham, publishes its statistics in the body of the medical superintendent's report, so that the discussion of them is almost swamped by the tables. There were 660 patients on the books at the end of last March. Twelve and a half per cent. of the patients admitted were suffering from general paralysis. The death-rate was 11·8 per cent. and the recovery-rate 41·2 per cent. The general health was good and there were only five cases of tuberculosis, two of erysipelas, and one of scarlet fever. Autopsies were held in all cases where permission was given. The dental surgeon made 540 examinations; the gynæcologist made 63, and the laryngologist 142. Research work has been continued on the distribution of nitrogenous compounds in the plasma and cerebro-spinal fluid, on cholesterol and glucose in the blood, and on the radiography of the alimentary tract. A series of films has been prepared showing characteristic motor manifestations in mental disorder. Two electrically heated ovens and a boiling table have been installed to replace gas-cooking apparatus. The dietary has been improved. Among recent additions to the equipment of the hospital is a fine bowling green. Limited parole is given to 20 patients. Twenty-three men and 30 women nurses are certified or registered.

The *Brighton County Borough Mental Hospital* at *Haywards Heath* had 847 patients resident at the end of the year and showed a recovery-rate of 39·37 and a death-rate of 8·6 per cent. There was a small epidemic of influenza in the spring, but no dysentery. Eighteen patients have tuberculosis. Over 50 patients have had full parole daily and another 50 have had parole in the grounds. Over 100 patients, mostly women, have attended weekly classes for country dancing and have benefited considerably. The women patients have formed a debating society; from their deliberations several suggestions for their comfort have arisen and many have been approved. Except in one ward all the women now have their own clothes, marked with their names, and they appreciate this very much. Twenty patients have been home for week-ends and eight men went home for Christmas. Over 50 have been allowed to visit Brighton, Eastbourne, and London for the day on parole; there has never been any trouble about return to hospital. Six wards have open doors. The Guardianship Society has given invaluable aid to discharged patients, finding them homes and employment. The out-patient clinic in Brighton has now treated 192 patients, only 12 of whom have had to be certified. The dental surgeon treated 690 patients during the year and extracted 694 teeth. Stress is laid on open-air treatment at this hospital. A cinema is being erected and a stable is being turned into a laboratory, while plans are being made for an admission hospital, which will meet the immediate threat of overcrowding. Sixty-five nurses are certificated or registered.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 1ST, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 102 (last week, 141); scarlet fever, 1376; diphtheria, 851; enteric fever 122; (last week, 153); pneumonia, 508; puerperal fever, 32; puerperal pyrexia, 89; cerebro-spinal fever, 4; acute poliomyelitis, 6; acute polio-encephalitis, 4; encephalitis lethargica, 27; continued fever, 2; dysentery, 6; ophthalmia neonatorum, 92. No case of cholera, plague, or typhus fever was notified during the week.

The following counties each notified 3 or more cases of enteric fever: London, 17; Berks, 3; Chester, 3; Devon, 4; Essex, 23 (of which Colchester 15); Huntingdon, 7 (of which St. Ives, U. and R. 6); Lancaster, 9; Middlesex, 7; Norfolk, 3; Sussex East, 3; Monmouth, 4; The total of 122 includes 42 cases of paratyphoid fever, of which 13 were notified in London and 6 in Huntingdonshire.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Sept. 4th and 5th was as follows: Small-pox under treatment, 7; scarlet fever, 1477; diphtheria, 1472; enteric fever, 112; measles, 118; whooping-cough, 244; puerperal fever, 14 (plus 7 babies); encephalitis lethargica, 71; poliomyelitis, 1; "other diseases" 20. At St. Margaret's Hospital there were 14 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was no death from small-pox, 6 (1) from enteric fever, 9 (0) from measles, 5 (5) from scarlet fever, 27 (3) from whooping-cough, 15 (1) from diphtheria, 86 (23) from diarrhœa and enteritis under two years, and 20 (4) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London were reported from Southend-on-Sea 2, Bolton, Manchester, and Salford, 1 each. Of the 9 fatal cases of measles, 2 each were reported from Wolverhampton, Liverpool, and Cardiff. There was no fatal case of scarlet fever outside London. Of the 24 fatal cases of whooping-cough outside London, 3 each were reported from Willesden and Leeds, while Glasgow reported 6 for the same week. Liverpool again reported 9 deaths from diarrhœa, Birmingham and Manchester 5 each, and Hull 4, while Glasgow and Dublin reported 6 and 8 respectively.

The number of stillbirths registered during the week was 250 in the great towns (corresponding to a rate of 36 per 1000 births), including 53 in London.

special report in September he recommended his committee to consider the question of providing immunisation facilities, and the consideration of the report was deferred until the medical staff had been strengthened by the appointment of an assistant medical officer of health. There were 14 notifications of encephalitis lethargica and seven deaths attributed to it. During the last nine years there have been 130 notifications and 56 deaths from this disease. The antenatal clinic is conducted by a gynæcologist, Dr. S. A. Ballantyne. Of the 265 cases seen 160 were maternity cases booked for the Coventry and Warwickshire Hospital and 45 booked for the Gulson-road (poor-law) hospital. Of the remainder 43 were sent by midwives, 10 came of their own accord, and 7 were not pregnant. The total births numbered 2065. The Council paid £1201 for maternity cases sent to the two hospitals mentioned and received back in contributions £696 16s. 6*d*. The chief health visitor, Miss Barratt, has been appointed infant protection visitor by the Coventry guardians. It has again been impossible to operate the sections of the Housing Acts relating to the closure of unfit houses, owing to the absence of alternative accommodation. In referring to the close association of the school medical and infant welfare services Dr. Snell emphasises the desirability of providing some leisure for the medical members of the staff to engage in research. The open-air residential school, situated on high ground about five miles from the city, has been rebuilt to accommodate 90 children, and was officially opened by the mayor in July. The day open-air school held on part of the roof of the Centaur-road school was much interfered with by the wet weather of 1927.

Halifax.

Dr. Cyril Banks says the issue of his report has been delayed owing to the full energy of the health department having been concentrated on the suppression of small-pox. During the year 1927 there were "three invasions" of the town by small-pox, amounting in all to 12 cases with no deaths. For the first time since 1921 the Registrar-General has estimated a slight increase in the population. The death-rate was higher than usual owing to a sharp outbreak of influenza in February and March. The deaths attributed to influenza numbered 65. The infant mortality-rate was 11 higher than in the previous year, and Dr. Banks discusses the reasons for the high neonatal and maternal mortalities from childbirth. Dr. Banks considers that the difficulty with regard to smoke from domestic chimneys need no longer exist. From his experience "Coalite" produces bright, clean, hot fires with no smoke, no dirty kettles and pans, and no need for the chimney sweep. The orthopædic scheme under the direction of Mr. F. W. Goyder, F.R.C.S., has done excellent work. Of the 44 cases under the school age treated 34 were rickets. Of the 222 of school age 62 were cases of flat-foot, 56 of stoop, 32 of lateral curvature, 11 of infantile paralysis, 11 of rickets, 6 of infantile hemiplegia, 5 of torticollis, and 4 of Erb's paralysis. Mr. Goyder points out that the staff of the clinic needs to be increased and that another masseuse should divide her time between the clinic, the schools, and the maternity and child welfare centre. In order to help the work a lamp for ultra-violet radiation has been installed at the Northgate centre.

Great Yarmouth.

Dr. A. N. Stevens draws attention to the fact that 50 per cent. of the deaths in the town during the year under review occurred at ages over 65, and 32 per cent. at ages over 75. The total rainfall was 31·96 in. and the hours of bright sunshine 1513·7. In discussing the work of the tuberculosis dispensary Dr. Stevens refers to the difficulty of getting contacts to submit themselves for examination. The notifications in 1927 numbered 133 and the average for the preceding five years was 87, but the number of contacts examined during 1927 was only 21. There are still 24 wells in the borough, many of which "are without doubt liable to pollution at times," but Dr. Stevens thinks that "unless the samples for analysis happen to be taken at one of such times" these wells cannot be dealt with. The new houses erected numbered 348 of which 276 received State assistance. Under the new milk regulations general shopkeepers are only to be permitted to sell milk in sealed bottles.

Dover.

Dr. A. B. McMaster records a severe epidemic of influenza in the first quarter of the year. At the end of 1927, after revision, the tuberculosis register contained 356 pulmonary and 99 non-pulmonary cases, the two sexes being in about equal proportions. The tuberculosis notifications numbered 91 and the deaths 51, so that the names on the register are five times the notifications for the year and nine times the deaths. Since the new scarlet fever antitoxin came into use at the isolation hospital (in 1926) the number of complications and the duration of stay at the hospital have been reduced. Dr. McMaster points out that the number of cases is too small to draw general conclusions from, but that the facts are suggestive of the value of the new antitoxin. The senior sanitary inspector attended the "clean milk" course at Wye Agricultural College. Greater use is being made of the hospital beds provided at the Royal Victoria Hospital for complicated maternity cases.

MENTAL HOSPITAL REPORTS.

THE annual report of the *City of Birmingham* Asylums Committee is of particular interest this year, as it opens with a report, from the chief medical officer, of the medical work in both institutions. The principal feature is an inquiry into the ravages of physical disease, particularly focal sepsis, among mental patients. Oral sepsis was found in 77 per cent. of the 531 cases admitted, and many of the remaining 23 per cent. were edentulous, so that a really healthy mouth was rare. The commonest type of septic mouth was gross suppurating periodontitis. Septic conditions of the ears, throat and air passages were found in half the patients, and 161 out of 180 examined revealed evidence of infection in one or more sinuses, while 40 had chronic suppurative inflammation of the ear. Operations by the laryngologist numbered 174, and no patient appeared to be worse after them, physically or mentally, while improvement followed by discharge was often recorded. Apart from the general toxic effect of these conditions, it is possible that infection passes directly to the brain from the nose and throat; certain work on two cases of advanced epilepsy and mental disorder has pointed to direct invasion of the cranial cavity through diseased bone. The gynæcologist has also played his part in the detection of sepsis, and has found T.A.B. vaccine useful for many resistant cases of septic cervicitis. A review of the ætiological rôle of influenza in mental disturbance suggests strongly that the virus plays a large part, both immediately and after a delay of several months.

After this interesting medical summary the reports of the two mental hospitals seem more than usually statistical. At *Winson Green* there were 763 patients at the end of the year. The recovery-rate was 41·4 per cent., with an additional "discharged relieved" rate of 11·1 per cent. More than half the patients admitted during the year were totally discharged, 68 of them after a preliminary month's trial. The death-rate of 6·45 per cent. is the lowest in the history of the hospital. Autopsy was performed in 84 per cent. of possible cases. The extensive parole allowed resulted in 12 escapes, but the superintendent regards the liberty as "well worth it." All were safely returned. The general health was very good and only two patients were under treatment for tuberculosis at the end of the year. A number of operations for septic foci were performed and most of them were followed by improvement, either directly or after a subsequent treatment by protein shock (T.A.B. vaccine). Nearly 100 patients received maintain a high standard of achievement. In his preface Mr. Ogilive states that the difficulty which confronted him was to decide what recent surgery is and what constitutes an advance. Advance in surgery is not commonly a thing of sudden birth and it must be rare indeed to find that the conception of a new method is followed rapidly by its evolution in a practical and useful form; this is usually a process lasting many years. In spite of obvious difficulties, however, the author has succeeded in writing a clear, concise, and systematic account of the latest work in all branches of surgery. The magnitude of his task may be estimated by the references to recent surgical iterature at the end of each chapter. These references hould be of very great value to the busy surgeon who ishes to consult a small number of modern papers on ny aspect of his subject. Much of the best surgical erature of the last few years is quoted here. One the most interesting chapters is that on plastic gery. The impetus given to this branch of surgery the war makes it obviously a recent advance; importance has hardly diminished in peace time is not likely to diminish while modern machinery motor-cars continue their devastating progress. In the section on the toxæmia of acute intestinal obstruction the use of bile as a therapeutic measure is not mentioned, perhaps because it has hardly yet emerged from the purely experimental stage. There is one serious blemish for which the author may not be entirely responsible—the frequency with which the reader is told that a full description of some test, with a distinct surgical application, is to be found in the companion volume on Medicine. There are some omissions which spoil the symmetry of the sections in which they occur. It is clear that the object is to save space by avoiding repetition and not to advertise a book which is far too popular to need such assistance. but a certain amount of overlapping is preferable to the need for simultaneous consultation of two volumes. We trust that in the next edition Mr. Ogilvie will supply these few pages which will make his excellent book complete by itself.

Latent Tuberculosis.

La tuberculose pulmonaire latente. By Prof. J. Rieux. Paris: Gaston and Co. Pp. 247 and plates. Fr.27.

The author has written this book out of the rich fullness of 35 years' experience as Médicin-Inspecteur of the French Army. During this long period he has had ample opportunity of studying the question of latent tuberculosis in the young adult male population of France as it passes into the ranks of the Army. Many terms have been devised to express this condition in French military parlance—"présuspecte, bronchite de sommets, sclérose de sommets"—but the author rejects them all as unsatisfactory and adheres to the term of latent tuberculosis. He lays down certain conditions for the definition. The lesion should be manifest and accessible to investigation, its tuberculous nature should be proved, but the stage of its evolution should not be capable of recognition. Prof. Rieux devotes six chapters to an exposition of his subject, including symptomatology, radiology, and clinical pathology. At the end of the volume a number of illustrative cases are cited and a collection of radiograms, which last appear to have suffered a little in the process of reproduction. No strikingly new work is described—there is, indeed, none to describe—but the book is comprehensively written and forms a lucid presentation of the subject.

Rules for Recovery from Pulmonary Tuberculosis.

Fifth edition, thoroughly revised. By Lawrason Brown, M.D. Philadelphia and New York: Lea and Febiger. 1928. Pp. 244. $1.50.

Dr. Lawrason Brown believes that in pulmonary tuberculosis the physician must not only be prepared to do what is right himself, but also to make the patient, the attendants, and externals coöperate. The well-tried book before us is therefore intended to supplement the care of the physician which can only carry the phthisical patient a short distance on the way to recovery. The physician of to-day must, the author recognises, *teach* in order to serve most intelligently, and his own teaching in this little book has saved countless lives of a type which are peculiarly worth saving. Not dramatically, as a surgeon saves lives, but with precept upon precept, line upon line, chosen for effect. The book is not intended for skimming but to be gone over chapter by chapter day by day, for, as the author remarks, with increasing knowledge new and important facts may be discovered in many of its paragraphs. The present edition lacks the illustrations of the earlier editions, but the reader is referred to the *Journal of the Outdoor Life*, where they may be found.

The Surgery of the Skin.

Chirurgie der Haut und des Unterhautzellgewebes. By Dr. F. R. Ascher. Being an instalment of *Die Chirurgie*, by Prof. Dr. M. Kirschner and Prof. Dr. O. Nordmann. Berlin and Vienna: Urban and Schwarzenberg. 1928. With 46 illustrations and 29 coloured plates. Pp. 263. M.22.

This production on the surgery of the skin and subcutaneous tissues forms a small part of a new text-book on surgery, both general and special, by numerous writers. It cannot be purchased separately. After a short historical and anatomical introduction, the subjects discussed include nævi and other congenital conditions, such as v. Recklinghausen's disease, the various types of skin wounds, including gunshot and caustic wounds, and dog-bites, with the lines of treatment specified. Damage of the skin by heat, light, and X rays, electricity, lightening, and radium are next considered, and then follow the surgical aspects of furunculosis, erysipelas, tuberculosis, actinomycosis, anthrax, &c. The circulatory disturbances of the Raynaud type, gangrene, erythromelagia, and ulcers of the leg are fully discussed, and also neoplasms, benign and malignant. The volume has been written by a surgeon for surgeons, and with such a title should, we think, contain a chapter on the plastic surgery of the skin and the modern methods of skin-grafting.

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Health and Cleanliness.

By W. A. Muir, M.D., D.P.H., Medical Officer of Health for Gillingham, Kent; and George H. Green, B.Sc., B.Litt., M.A., Ph.D., Lecturer in Education, University of Wales. London: The Health and Cleanliness Council. 1928. Pp. 63. Gratis.

This little text-book for teachers is still a further manifestation of the remarkable activity of the Health and Cleanliness Council, which seems to suffer from no shortage of funds for the free issue of educational material. After a brief foreword by Dr. George F. Buchan, M.O.H. of Willesden, and a concise introduction, it deals in nine lessons with the teaching of children about cleanliness of the person, of the home (especially the kitchen), of food, of personal and bed-clothing, and about the special problems of cleanliness while in camp or at picnics. The book is illustrated with reproductions of the now well-known posters of the Council, and is a model of its kind. How valuable this cleanliness propaganda would have been 50 or 100 years ago, when the dirt-diseases were really a serious menace! There is just a little danger now that too much stress on this one aspect of public health education may create an ill-balanced conception of the whole problem in the child-mind.

Reviews and Notices of Books.

THE OPIUM PROBLEM.

By CHARLES E. TERRY, M.D., and MILDRED PELLENS. New York: The Committee on Drug Addictions. 1928. Pp. 1042.

THIS work, though formidable in its dimension, is stated to be condensed from a report prepared under the direction of the Committee on Drug Addictions of New York, in collaboration with the Bureau of Social Hygiene. It presents a review of the literature of the Narcotic Drug Problem, drawn largely, but by no means exclusively, from American sources. It deals with the extent, development, ætiology, nature, pathology, symptomatology, and treatment of drug addiction, and finally discusses efforts at control of the commerce in opium and other narcotics, municipally, nationally, and internationally.

The probability that the Geneva Opium Convention of 1925, which implements The Hague Convention of 1912, will shortly come into operation, makes the appearance of this work opportune. By a review of standard works, treatises, and monographs, by questionaires directed to medical and administrative authorities, and by a digest of conventions, laws, and regulations, the authors have endeavoured to furnish students of the opium question with a "fairly composite picture of professional and official opinion and attitude of the day as to the medical and sociologic aspects of the problem." The authors are not prepared to confirm the assertion that the number of addicts in the United States exceeds a million, but are satisfied that their "surveys and estimates indicate sufficiently clearly the existence of a major medico-social problem" to be confronted. The early use of opium as an anodyne in Asia, its introduction into Western countries, and the discovery of its value for other than therapeutic purposes, the spread of the use of the hypodermic syringe, and the differentiation of the pharmacological properties of the alkaloids derived from opium are related. The view is expressed "that there are certain persons who, by reason of definite psychical characteristics, more readily become victims of the chronic use of the drugs"; but while discussing various attempts to elucidate the ætiology of narcotic addiction, the authors are not satisfied that a truly scientific explanation has yet been vouchsafed, and urge the need of further research into "the mechanism of the phenomena recorded." In a later chapter, however, the conclusion is reached that "there is no type which may be called the habitual user of opium," and that addiction is "not restricted to any social, economic, mental, or other group." In regard to treatment, the relative advantages of complete and partial withdrawal of the drug are stated, but the conclusion is arrived at "from the material reviewed that the treatment of this condition has not emerged from the state of empiricism."

Efforts at control of the foreign commerce in opium were made by the United States as early as the 'thirties and 'forties of last century, more especially in regard to China, Siam, and Japan. It was, however, after the acquisition of the Philippine Islands by the United States that American attention was more particularly directed to control of narcotic traffic in the Far East. Bishop Brent, who had become aware of the abuse of opium by the Philippinos, in 1906 urged President Roosevelt to international action, and this resulted in the Shanghai Commission of 1909. That Commission, to which representatives of America, Great Britain, Austro-Hungary, Germany, France, Italy, China, Japan, the Netherlands, Persia, Portugal, Russia, and Siam were invited, recognised the sincerity of China in grappling with the opium trade, the need for suppressing the smoking of opium, the necessity for controlling the manufacture and distribution of morphine and other drugs also liable to abuse, and, above all, that the question was not one for the Far East alone, but that the Occident as well as the Orient was suffering from the abuse of narcotics, and that any real control of the commerce in these dangerous drugs must be international and, indeed, world-wide. The United States followed up the report of the Shanghai Commission by inviting an international conference at The Hague to conventionalise the findings of the Commission. This Conference, after some demur by the British Government arising from their recent agreement with China to terminate the Indo-Chinese opium trade, met at The Hague in 1911–12, and further conferences were held there in 1913 and 1914. The International Opium Convention of 1912 marked not only a new departure in international effort, but bound its contracting parties to the introduction of legislation to give effect to its provisions. The Convention sought to regulate the production and distribution of raw opium, to suppress the use of opium "prepared" for smoking, and to limit the manufacture, sale, use, import, and export of morphine, heroin, and cocaine to "medical and legitimate purposes." Twelve powers only had taken part in the first Hague Conference, but by 1913 some 46 had signed it, and ratification was proceeding. The intervention of the Great War paralysed the progress of international coöperation from 1914 to 1918, but the Peace Treaties of 1919 secured the adhesion of Powers which had previously refused ratification. Great Britain, by the Dangerous Drugs Act of 1920 and 1923, gave legislative effect to The Hague Convention as regards the Mother Country. By an Act of 1914, known as the Harrison Narcotic Act, amended in 1918, 1926, and 1927, the United States put The Hague Convention into operation within its borders, and by the Jones-Miller Act of 1922 restricted foreign trade in narcotics. By the Covenant of the League of Nations, the supervision and execution of agreements in regard to the traffic in dangerous drugs was entrusted to the League. The story of the action of the Council and Assembly of the League and of its Advisory Opium Committee is related, and also that of the prolonged and contentious opium conferences at Geneva in 1922–23, which resulted in a fresh agreement among Powers with possession in the Far East, and a new Convention reproducing and supplementing The Hague Convention to which all States could adhere. It is this last instrument which will come into force on Sept. 25th, and although the United States and Chinese representatives withdrew from the Conference and are no parties to the Convention, it should, through the Central Board it sets up, increase the control of the traffic and reduce the scandalous amount of illicit trade.

This compendious work of Dr. C. E. Terry and Miss Pellens will prove a timely and serviceable aid to students of the opium problem and of the tangled story of efforts after international control of traffic in dangerous drugs.

RECENT ADVANCES IN SURGERY.

By W. HENEAGE OGILVIE, M.D., M.A., M.Ch. Oxf., F.R.C.S. Eng. Assistant Surgeon. Guy's Hospital, and Lecturer in Clinical Surgery to Guy's Hospital Medical School; Surgeon to Out-patients, Hampstead General and North-West London Hospital. *London: J. and A. Churchill.* 1928. Pp. 461. 15s.

THE success of "Recent Advances in Medicine," the first number of the series to which the present volume belongs, has encouraged the publishers in the production of several books which are widely read and admired. The surgical volume, which might reasonably have been the second volume to appear, actually comes no higher than tenth in the list, and has been eagerly anticipated. It is well worth waiting for. The burden of its preparation has fallen chiefly on the author whose name appears on the title page, but he has been ably assisted by some of his colleagues. The chapters on cancer, plastic surgery, chest surgery, and venereal disease have been written respectively by Mr. J. F. Carter Braine, Mr. T. P. Kilner, Mr. Grant Massie, and Mr. V. E. Lloyd, all of whom maintain a high standard of achievement. In his preface Mr. Ogilive states that the difficulty which confronted him was to decide what recent surgery is and what constitutes an advance. Advance in surgery is not commonly a thing of sudden birth and it must be rare indeed to find that the conception of a new method is followed rapidly by its evolution in a practical and useful form; this is usually a process lasting many years. In spite of obvious difficulties, however, the author has succeeded in writing a clear, concise, and systematic account of the latest work in all branches of surgery. The magnitude of his task may be estimated by the references to recent surgical literature at the end of each chapter. These references should be of very great value to the busy surgeon who wishes to consult a small number of modern papers on any aspect of his subject. Much of the best surgical literature of the last few years is quoted here. One of the most interesting chapters is that on plastic surgery. The impetus given to this branch of surgery by the war makes it obviously a recent advance; its importance has hardly diminished in peace time and is not likely to diminish while modern machinery and motor-cars continue their devastating progress. In the section on the toxæmia of acute intestinal obstruction the use of bile as a therapeutic measure is not mentioned, perhaps because it has hardly yet emerged from the purely experimental stage. There is one serious blemish for which the author may not be entirely responsible—the frequency with which the reader is told that a full description of some test, with a distinct surgical application, is to be found in the companion volume on Medicine. There are some omissions which spoil the symmetry of the sections in which they occur. It is clear that the object is to save space by avoiding repetition and not to advertise a book which is far too popular to need such assistance, but a certain amount of overlapping is preferable to the need for simultaneous consultation of two volumes. We trust that in the next edition Mr. Ogilvie will supply these few pages which will make his excellent book complete by itself.

Latent Tuberculosis.

La tuberculose pulmonaire latente. By Prof. J. Rieux. Paris: Gaston and Co. Pp. 247 and plates. Fr.27.

The author has written this book out of the rich fullness of 35 years' experience as Médicin-Inspecteur of the French Army. During this long period he has had ample opportunity of studying the question of latent tuberculosis in the young adult male population of France as it passes into the ranks of the Army. Many terms have been devised to express this condition in French military parlance—"pré-tuberculose, imminence tuberculose, bronchite suspecte, bronchite de sommets, sclérose de sommets"—but the author rejects them all as unsatisfactory and adheres to the term of latent tuberculosis. He lays down certain conditions for the definition. The esion should be manifest and accessible to investiation, its tuberculous nature should be proved, but the stage of its evolution should not be capable of recognition. Prof. Rieux devotes six chapters to an exposition of his subject, including symptomatology, radiology, and clinical pathology. At the end of the volume a number of illustrative cases are cited and a collection of radiograms, which last appear to have suffered a little in the process of reproduction. No strikingly new work is described—there is, indeed, none to describe—but the book is comprehensively written and forms a lucid presentation of the subject.

Rules for Recovery from Pulmonary Tuberculosis.

Fifth edition, thoroughly revised. By Lawrason Brown, M.D. Philadelphia and New York: Lea and Febiger. 1928. Pp. 244. $1.50.

Dr. Lawrason Brown believes that in pulmonary tuberculosis the physician must not only be prepared to do what is right himself, but also to make the patient, the attendants, and externals coöperate. The well-tried book before us is therefore intended to supplement the care of the physician which can only carry the phthisical patient a short distance on the way to recovery. The physician of to-day must, the author recognises, *teach* in order to serve most intelligently, and his own teaching in this little book has saved countless lives of a type which are peculiarly worth saving. Not dramatically, as a surgeon saves lives, but with precept upon precept, line upon line, chosen for effect. The book is not intended for skimming but to be gone over chapter by chapter day by day, for, as the author remarks, with increasing knowledge new and important facts may be discovered in many of its paragraphs. The present edition lacks the illustrations of the earlier editions, but the reader is referred to the *Journal of the Outdoor Life*, where they may be found.

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AIDS TO EMBRYOLOGY.

By RICHARD H. HUNTER, M.D., M.Ch., Lecturer in Anatomy, Queen's University, Belfast. London: Baillière, Tindall and Cox. 1928. Pp. 160. 3*s.* 6*d.*

THIS little book contains a good deal of information, given, of course, in a much abbreviated form. We do not believe in the utility, for the student of medicine, of accounts of development shorn of their details, so that, from this point of view, we consider the chapters which deal with general theories to be the best in the book; but for students who merely look on embryology as an examination necessity this little work will prove an admirable aid. It is only fair to say, however, that in some matters Dr. Hunter does not adopt the descriptions of parts undergoing development which are usually found in most English textbooks.

PERCIVAL'S MEDICAL ETHICS.

Baltimore: The Williams and Wilkins Company. 1927. Pp. 291. 13*s.* 6*d.*

Thomas Percival was born in Warrington in 1740, and entered the University of Edinburgh at what was then the rather advanced age of 21. From boyhood he had been a student and when he settled in practice in Manchester he became associated with the founding of the Manchester Literary and Philosophical Society, a distinguished body which fostered among others Dalton and Joule. Percival must have been a man of striking personal characteristics, for he was elected a Fellow of the Royal Society before he had made any public mark, and even in the eighteenth century, when the favours of private interest were bestowed with particular cynicism, his election seems to have caused surprise. However, in this event it was justified, for his public work in Manchester, where he lived all his life, led to the formation of proper sanitary standards in the city, and laid the foundation for factory legislation in the whole country. His work on medical ethics, which has now been edited by Prof. Chauncey D. Leake, the well-known pharmacologist of Wisconsin, was written for the guidance of his son, a medical student. It is entitled "A Code of Institutes and Precepts Adapted to the Professional Conduct of Physicians and Surgeons," and it was very thorough in its scope, taking regard of the medical position in hospitals, in private practice, and also in public situations—indeed, in its inception it was a work of medical jurisprudence. It may be thoroughly recommended for perusal by those who wish to understand what were in the eighteenth century the essential matters to be regarded for the formation of proper relations between medicine and the public, and it is interesting to note that in the twentieth century the main lessons are perfectly apposite, though in detail so many circumstances have changed. Both the editor and the publishers are to be thanked for an interesting volume. The London agents for the publication are Messrs. Baillière, Tindall and Cox.

THE YOUNG MAN AND MEDICINE.

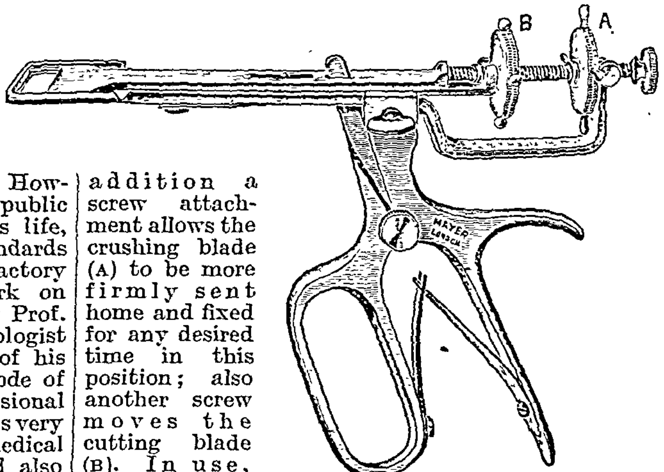
By LLEWELLYS F. BARKER, M.D., LL.D., The Macmillan Company. 1928. Pp. 202. 10*s.* 6*d.*

Dr. Barker is Professor Emeritus of Medicine in Johns Hopkins University, New York, and it is, consequently, out of large experience that he addresses his book "to the young men in medicine with whom I have had the privilege of association in Canada and in the United States." His purpose, in the first instance, has been to help those who have not reached any final decision as to what they want to do in life. The question is one which he thinks should be decided by themselves, but for this purpose guidance should be supplied out of the experience of leaders in various professions and callings. This small book is one of a series, termed the "Vocational Series," in which, for the information of the young man, the various things which he has to consider before deciding to be a lawyer, a clergyman, a doctor, a journalist, and the rest, are set out. The medical track is well charted, though some of the advice given is more suitable to one who is on the journey than one who has not yet made up his mind to start.

New Inventions.

THE LA FORCE GUILLOTINE.

IT is now nearly 12 months since an American visitor demonstrated the La Force guillotine to me. I have used the instrument many times and feel that its employment should be much more general in this country. As far as I know it is rarely used. The instrument is built on the pattern of the Ballenger guillotine, but with two sliding parts, the upper (or outer, when considered as in use on the tonsil) which is slightly roughened and clamps the tissue between tonsillar capsule and constrictor muscle, and the inner or cutting blade. Both are worked from a scissor or forceps handle as in the Ballenger pattern, but in addition a screw attachment allows the crushing blade (A) to be more firmly sent home and fixed for any desired time in this position; also another screw moves the cutting blade (B). In use, under general and complete anæsthesia to produce relaxation, the tonsil is engaged and dealt with as in any other enucleation operation with the guillotine, but after the crushing or hæmostatic blade has reached the bottom of the fenestrum it is still more firmly forced down and held in position by the screw. The cutting blade is then forced down by turning the second screw and withdrawn by reverse action of this screw, and the tonsil now freed from its bed lifted out with suitable forceps, such as Luc's, or with a sponge-holder. The hæmostatic blade is allowed to remain on for five minutes or more, when it is released by unscrewing, and the guillotine removed. In favourable cases there will be no bleeding at all, or at most only a slight tinging of the mucus in the pharynx; in the majority of cases there has been no need to use a single swab. There is singularly little pain or discomfort in the 48 hours following operation and in this, the method contrasts very favourably with other guillotine enucleations or with dissection. The instrument is not so easy to use as the O'Malley, and a slightly larger percentage of failures to enucleate the tonsil cleanly will result. I have no hesitation in stating that when successful the method is ideal, but like all others the La Force occasionally fails.



The instrument is made by Messrs. Mayer and Phelps, New Cavendish-street, London.

LINDLEY SEWELL, M.B., B.S. Lond.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 15, 1928.

EPILEPSY AS A SOCIAL PROBLEM.

ALTHOUGH there are probably few diseases which have been recognised for a longer time and about which more has been written than epilepsy, it has to be admitted that as a social problem it has hitherto received comparatively little, and certainly quite inadequate, consideration. For this reason the two articles which we publish in the present number, the one (p. 568) on the results of a census made in Surrey and the other (p. 545) on the subsequent history of a number of children who have passed through a residential school, are worthy of careful attention. To those who are unaware how scanty are our statistics of disease which does not concern the sanitary or the burying authorities it may come as a surprise to learn that there are no reliable figures as to the incidence of epilepsy. Moreover, in view of the wide differences in the frequency of attacks, the great variations in type and severity which undoubtedly result in many cases being unrecognised, and the fact that epileptic attacks not uncommonly occur as a complication or symptom of some even graver and more urgent condition, it may safely be said that it would be impossible to obtain any complete and reliable statistics regarding the incidence of the disease. The Permanent Committee on Epileptics did not attempt the impossible. They limited their census to a definite area—namely, the county of Surrey—and to such persons as were chargeable to public authorities. They found that in the area examined the proportion of such epileptics amounted to 0·65 per 1000 of the general population, and, if this may be accepted as a fair sample of the country as a whole, they estimate that in England and Wales there are 25,000 persons affected by this disease who are a public charge. Of this number rather more than one-third—again judging from Surrey experience—are mentally normal, whilst the remainder are either insane or mentally defective. It is clear, therefore, that from the point of view of incidence alone the problem of the rate-supported epileptic is a serious one. It becomes the more so in view of the facts ascertained by the Committee that one-quarter of the total number of educable epileptic children are attending no school or institution, and that of those who come within the scope of, and should be dealt with under, the Mental Deficiency Acts, less than one-fifth are in fact so dealt with.

No doubt when epilepsy is complicated by, or has induced, serious mental defect or deterioration there is little likelihood of the sufferer being rendered economically useful; but there are many young mentally normal epileptics who drift into chronic unemployability for want of proper education and training, and there is every reason to believe that the absence of such care is also an important factor in bringing about mental deterioration in a number of cases. Dr. J. TYLOR FOX, medical superintendent of Lingfield Epileptic Colony, in his account of the after-history of 332 children who passed through the colony in a period of eight years, shows the benefits which may result from training in a suitable residential school. Although the children admitted to Lingfield are a worse than average group, inasmuch as they suffer from attacks which are too severe to allow of them attending ordinary schools, their subsequent history shows that 28 per cent. of the total have become partly or entirely self-supporting. When the unpromising nature of the raw material is borne in mind this result must be considered as very satisfactory and as demonstrating the value of the treatment and training received. Unfortunately, the accommodation at present existing for cases of this kind is so inadequate that these advantages are only available for a relatively small number. Dr. Fox estimates that the proportion of "educable" epileptic children who are accommodated in residential special schools is only about one-fifth of the total in existence, the remainder either drift into poor-law or other institutions or they are allowed to remain at home. In any event it may safely be said that the great majority of them receive little if anything in the nature of skilled treatment and training. In addition to this, as we have already mentioned, the accommodation available for those in whom the epilepsy is accompanied by mental defect is equally unsatisfactory. A careful study of the facts presented points conclusively to the serious nature of the problem, and to the utter inadequacy of the existing accommodation for the epileptic, whether mentally normal or abnormal. It may be that some of these matters will be dealt with by the Board of Education Committee on Mental Deficiency now sitting, whose report, we understand, will be published before the end of the year. It may also be that some attention will be given to the problem in the alterations to the poor-law system which are imminent. In any case, however, it cannot be doubted that epilepsy constitutes an important social problem, and that the time has arrived when it should receive serious consideration from this aspect.

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THE FALLING BIRTH-RATE.

THE birth-rate for 1927 turns out to have been the lowest recorded in this country since the establishment of civil registration, and responsible citizens hold up their hands in horror, wondering what the young people are coming to. A sane view of the situation suggests that there is nothing to be horrified at except the spectacle of human beings responding to their environment in the same way as any other live thing, animal or plant. Large and increasing populations have been welcome in the past for two reasons. In the first place, they provided larger armies—a consideration which was perhaps natural in Old Testament times and was artificially flogged into prominence in Europe as late as the nineteenth century; it has now, we hope, gone for good. And in the second place, rulers and governors realised that large numbers are more likely than small ones to comprise those extreme variants in qualities of body, mind, and spirit on which leadership depends so much. We have, too, in the last 150 years become so accustomed to seeing the population of this country progressively growing larger and larger, and to hearing continually that there is a shortage of houses that we find it difficult to realise the possibility—indeed, as far as can be foreseen, the certainty—that our numbers will very soon cease to increase and that the population will return to the stationary position which it had, at a much lower absolute level, in the sixteenth and seventeenth centuries. Even the town-planner and the speculative builder do not seem to have appreciated the position.

If people really believed in evolution, they would have more constantly in mind the thought that man is the product of his ancestry and that he is likely in matters of large temporal importance to behave in ways analogous to theirs. The numbers of any animal or plant which are alive in any given area at any moment are the maximum which conditions allow. Breeding is actually or potentially profuse enough to keep the place as full of a particular species as it will hold; with plants it is generally a question of space, with animals of food. And so long as conditions remain unaltered this optimum population persists at the level which allows the greatest number of individuals to exist at a fairly high level of perfection; natural populations of animals and plants do not consist of starvelings but of individuals which are well grown, healthy, and reproductive. There is, in short, no striking evidence in the survivors that there is any injurious overcrowding. But if conditions alter, the optimum population changes too; the dandelion and other weeds of bare soil exist on the minor catastrophes of the earth's surface and the rat population varies directly with the available food-supply. Man needs space and, being animal, especially food, and under any given set of conditions he multiplies till the number of human beings is the largest which can obtain the return from life which they are prepared to accept as adequate. In comparison with smaller animals he reproduces slowly, but given time he will fill up any conditions in which he finds himself. He differs, of course, from animals in that he can to some extent make his own environment—though animals are not wholly without that capacity—and to that extent he can control his own optimum population. It is here apparently that anthropoid apes fall short. With, at any rate in the orang and gorilla, exceptional physical powers they lack the mentality to alter the circumstances of their life in such a way that they can be numerous. They are, in fact, all sparse; it was, we think, Sir Harry Johnston who estimated that there were not more than 10,000 chimpanzees in equatorial Africa and the larger ones are fewer still. We may guess that early man was hardly abundant by modern standards; conditions of life must have been very hard, and it was perhaps just a lucky chance that enabled him to multiply enough to reach the stage where by numbers and herd action he could have the mastery over other beasts. And it is most interesting to note, as Prof. Carr-Saunders has pointed out, how primitive man always regulates his numbers to the available food; profuse procreation seems to have come in with the Christian era and among savages the production of children is, as a rule, severely restrained, partly by rules and customs, partly by a sheer lack of fertility to which attention has often been drawn lately in the South Sea Islanders. As man's control over his circumstances developed and increased, so larger populations became possible and where and when possible they were automatically achieved. The flood of new people which flowed in this country all through the nineteenth century was the product of the changes known as the industrial revolution; the flood has slackened some time since and will soon come to a standstill unless some undreamed-of expansion in the facilities of life is discovered. Theoretically, a further growth of population might occur if the standard of living required were reduced. But it is very doubtful whether this factor is really capable of any deliberate control. The indefinable "adequate return" is not luxurious physical ease but the state in which a man can do best with his mind and body; "motor-cars *versus* babies" applies only to a negligibly small part of the population; the ordinary run of men have derived from their animal ancestors a far finer sense of coöperative life.

It follows, as Dr. F. A. E. Crew pointed out in his thoughtful address at the British Medical Association at Cardiff (reported at some length in our issue of Sept. 1st, p. 463), that we must look much further than the boom in frank contraception for our explanation of the diminishing birth-rate. The birth-rate in England began to fall 50 years ago in obedience to the principles of populative growth which, as Pearl has pointed out, apply to yeast cells and the fly *Drosophila* as well as to Spaniards and Dutchmen and Frenchmen and any live thing else. It has continued to fall along the predicted lines and, whether we like it or not, in the absence of some paroxysm of civilisation our numbers will soon cease to increase any further. Deliberate birth restriction may be having a good deal of effect in these, the later, stages of the process, but the main explanation is in man's unconscious or subconscious adjustment to his environment, in his animal response to circumstances. Those will view the Registrar-General's figures with the greatest calm who believe with the authors of the Bridgewater Treatises that the world is constructed in the best possible way.

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COMPENSATION FOR SILICOSIS.

Compensation for the occupational disease silicosis is more complicated than for other diseases on account of the long latency and chronicity of the complaint. It has so far only been granted in Great Britain and some of the overseas Dominions. South Africa, with regard to the Rand gold mines, was the first to act, and there prevention and compensation are closely interlocked. Thus any miner who develops ordinary pulmonary tuberculosis is suspended from employment in order to exclude infection from the other miners, and is compensated. In England action was taken first on somewhat similar lines in 1918 under a scheme applied to the small refractories industries. Thenceforward use of the legislative powers taken was delayed until 1927 when compensation was granted to metal grinders, but the somewhat complicated procedure adopted in the refractories' scheme was then abandoned. At the same time a scheme for the pottery industry is in preparation. Action on these lines, however, is proving wearisomely protracted; and every year men are succumbing to this acceptedly occupational hazard in such important industries as stonemasonry, granite-cutting, quarrying, and metalliferous mining, without any compensation. The Home Office has now abruptly altered its policy of proceeding industry by industry, and has just issued a comprehensive draft scheme for granting compensation for death and total disablement in practically every occupation in which the silica risk exists. Even men in coal-mines driving hard headings or sinking shafts through sandstone rocks are to be included, also millstone builders and abrasive soap-makers, as well as the crafts named above. The plan of insisting upon periodical medical examinations, and upon suspension with compensation of those showing early signs, is abandoned. Compensation is only to be granted for total disablement or death. At the same time, while proposing thus to award compensation which is clearly overdue, the Ministry announces the intention to examine in due course each industry affected in order to link up preventive procedure with compensation awards. This procedure is likely to lead rapidly to limitation of the silica hazard. It will have an indirect economic effect, even where large operations, such as the construction of the Liverpool Cathedral with a dangerous stone, have reached an advanced stage, for the cost of completion must be greatly enhanced. Indeed, the use of sandstones for building purposes is likely to cease; since, however, bricks, cement, and limestone are all home products, no unemployment will be caused thereby. When the proposed scheme has been ratified in whole or in part England will have resumed her usual lead in matters of industrial hygiene. At present, besides South Africa, New South Wales, in relation to the county of Cumberland and to the Broken Hill mines, is ahead of us; and so also are the Canadian provinces of Alberta and Ontario. In several American States, where in the Compensation Acts the word "injury" is defined to include diseases arising out of employment, silicosis is covered with other occupational diseases. In continental countries, on the other hand, no compensation has yet been granted; but in Germany, at any rate, researches already published by L. TELEKY and in progress by F. KOELSCH, must before long result in the granting of compensation. Silicosis is one of the most widespread and fatal of all occupational risks. It has already demanded the attention of the expert advisers of the International Labour Office at Geneva, due mainly to British representation; and is likely soon to be placed on the list of compensable diseases for international adoption.

PSYCHOLOGY IN THE MEDICAL CURRICULUM.

AT the meeting of the British Association the committee appointed to consider the place of normal psychology in the medical curriculum presented its final report. The committee consisted of the following members: Dr. W. BROWN (chairman), Dr. R. D. GILLESPIE (secretary), Dr. C. H. BOND, Prof. E. P. CATHCART, Dr. H. DEVINE, Dr. J. A. HADFIELD, Dr. BERNARD HART, Dr. D. K. HENDERSON, Colonel J. R. LORD, Dr. C. S. MYERS, Prof. G. M. ROBERTSON, Dr. T. A. ROSS, and Prof. T. H. PEAR. They find that of 26 medical schools of the British Isles, 13 offer no courses whatever in normal psychology, while 8 offer optional courses and 5 compulsory ones, but since the report was prepared Edinburgh University has decided to make attendance at a course of lectures in normal psychology compulsory. Most of the medical schools in the Dominions offer courses in the subject. The committee report that they have received official replies in favour of the provision and value of such courses, while the deans of most of the medical schools have responded to their inquiry. After carefully examining existing conditions, the committee recommend that in every medical school a compulsory course of instruction in normal psychology, of not less than 10 and of not more than 20 lectures, should be given during the pre-clinical years—preferably in the second year; and that, whenever possible, it should be supplemented by a course of about ten two-hour meetings in experimental psychology. The committee further recommend that such instruction should be so planned as to serve as a foundation for subsequent lectures in the pathology of the mind given during the clinical years of the medical course, and it need hardly be said that from the point of view of the bulk of medical practitioners this is a most important proposal, as it is in this way that proper correlation of academic instruction with clinical procedure may be obtained.

Thus psychology and physiology would be taught at the same stage of the medical curriculum, and this combination is from every point of view desirable. It is usual to consider the two subjects as parallel, dealing respectively with the normal functions of the human mind and of the human body. Prof. W. MCDOUGALL[1] claims a much wider field for psychology, proposing the distinction between the two sciences that physiology studies the processes of organs and tissues, whereas psychology studies the total activities of the organism. To admit this view without reserve would be to confess that the medical curriculum which contains no course in psychology is absurdly inadequate, and indeed future generations are likely to take this attitude. Meanwhile all will agree that just as physiology provides the necessary basis for subsequent instruction in pathology, so a simultaneous course in normal and experimental psychology would be an excellent preparation for the lectures in morbid psychology which belong to the clinical years. There can be little doubt as to the wisdom of the committee's recommendations. Psychological medicine was at one time almost confined to the study of insanity; to-day it is recognised that the disorders of the mind and of the nervous system embrace a far wider field, and that the ability to recognise them immediately and to treat them effectively are of enormous importance in the everyday practice of the family doctor. We now know that there is not an organ in the body whose disorderly function may not be due to neurotic conditions. The origin and spread of the exaggerated claims of certain schools of psychotherapy have been largely due to the lack of previous systematic training in normal psychology. The same ignorance has been responsible for the equally untenable position adopted by opposite extremists who believe that functional disorders are merely "imaginary" and therefore demand merely "imaginary" remedies, that medical instruction should be confined to the study of living matter and of material remedies, and that a knowledge of the workings and influence of the mind is of no concern to the ordinary medical student. However congested be the present curriculum, there can be no doubt that by general demand the recommendations of the British Association Committee must soon be carried into effect.

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[1] The Battle of Behaviorism. An Exposition and an Exposure. By John B. Watson and William McDougall. London: Kegan Paul, Trench, Trübner and Co. 1928. Pp. 103. 2s. 6d.

FACTORY INSPECTION.—The Home Secretary has appointed a Committee to consider and report what addition to the Factory Inspectorate is required, whether any changes in its organisation are desirable, and what other measures, if any, can be taken to enable the Factory Department to discharge adequately its duties now and in the future. The members of the Committee are:—Sir Vivian Henderson (chairman), Sir Gerald Bellhouse, Mr. R. R. Bannatyne, Mr. Kenneth Lee, Miss H. Martindale, and Mrs. C. D. Rackam. The secretary of the Committee is Mr. L. N. Blake Odgers, of the Home Office.

GERMAN MEDICAL JOURNEY TO EGYPT.—On the occasion of the centenary celebration of the University of Cairo, the Vienna Committee for Medical Tours Abroad has arranged a visit to Egypt covering the period Dec. 14th, 1928, to Jan. 4th, 1929, the journey out being made by Venice, Brindisi, and Alexandria, returning by Rhodes, Athens, and Corfu. The visit coincides with a Congress of Tropical Medicine and Hygiene in Cairo, and the usual winter international exhibition of medical arts and sciences. Programme and information from Dr. F. Barach, Vienna I., Biberstrasse 11.

Annotations.

"Ne quid nimis."

THE YEAR'S WORK AT THE MINISTRY OF HEALTH

ALTHOUGH we still await the Report of the Chief Medical Officer for last year much interesting information is, as usual, conveyed in the Annual Report of the Ministry of Health (1927–28).[1] Its summary of general health questions rightly gives prominence to the amendment of our mental deficiency legislation at the end of last year. The old restriction which confined the application of the Mental Deficiency Act to persons whose mental defect had existed "from birth to early age" has at last disappeared and the new definition of "mental defectiveness" is "a condition of arrested or incomplete development of mind existing before the age of 18 years, whether arising from inherent causes or induced by disease or injury." One advantage of this enlargement of the statutory definition is that it will now be possible to take suitable steps to provide care and treatment for persons suffering from the sequelæ of encephalitis lethargica. Another important piece of legislation which became operative in the past year is the Therapeutic Substances Act, 1925, which is designed to regulate the manufacture, sale, and importation of vaccines, sera, and other therapeutic substances whereof the purity and potency cannot adequately be tested by chemical means. The Act and Regulations, it is stated, have been brought into force without friction. One of the medical officers of the Ministry, in conjunction with a representative of the Medical Research Council, has inspected manufacturers' premises both in this country and on the continent. At the end of last March 36 licences to manufacture had been issued, 43 licences to import, and 11 licences to import for the purposes of research. Other matters summarised in the Report include the winding up of the Voluntary Hospitals Commission. Here, it seems, the Ministry considers that there is no further scope at the moment. "In view of the improved financial position of the voluntary hospitals and the fact that the Government had found themselves unable to make any grant-in-aid of the capital cost of hospital extensions," the Commission has been encouraged to bring its labours to a close by the presentation of its Final Report. Mention is also made of the work of the Committee on Post-Graduate Medical Education. The Committee unanimously decided that the establishment of a new centre with the 300 or 400 beds requisite for providing adequate clinical material was impracticable on the ground of the expense of initial capital cost and annual maintenance. The alternative was the conversion of an existing hospital, and the report gives the reasons for the selection of the West London Hospital at Hammersmith, where there is already a long tradition of post-graduate teaching. The carrying out of the scheme is still delayed by lack of the capital wherewith to make the desired structural alterations. National health insurance practitioners will read with interest the section of the Ministry's report which deals with medical benefit, its cost, scope and administration, the investigation of excessive prescribing, and the revision of the disciplinary procedure. On the whole the Report gives the impression of a general improvement in health standards and facilities. Historically there has been a fusion of public health and local government administration in England. It is satisfactory to find that, when the Minister's hands are so full with changes in the rating system and the poor-law, the claims of public health are not overlooked.

CHRONIC PYELITIS IN CHILDREN.

MUCH attention has been devoted in recent years to the chronic infections of the urinary tract in children. The occasional occurrence of a valve in the posterior urethra of boys, for example, which has been noted by many observers, suggests that congenital abnormalities should be looked for in chronic cases resisting treatment. In a recent article[1] P. György mentions that this particular deformity was described by Englisch in 1875, a fact which appears to have been ignored by recent writers. György goes on to discuss the causation of chronic pyelitis, quoting cases which have confirmed his view that chronic pyelitis is a serious disease and, if untreated, may well lead to severe affection of the kidney and even uræmia. In nearly all resistant cases some congenital abnormality or interference with the neuromuscular mechanism of the ureters, bladder, or urethra with their sphincters is present. Just as in cases of enlarged prostate in adults deficient renal function may be restored to normal after removal of the cause of obstruction, so treatment of an obvious deformity in the urinary tract in the chronic pyelitis of children is well worth while, even if evidence of impairment of renal function is present. The five cases described by György, however, must be regarded as due to defective neuromuscular mechanism since no congenital deformity could be found to account for the dilatation of the ureters. That many of the older theories with regard to the ætiology of pyelitis can no longer be accepted is brought out by I. Robertson in a plea[2] for further investigation of the pyelitis of infancy. He points out that the theories of infection by upward spread, by the general circulation, or by direct spread from the bowel are none of them satisfactory from the pathological standpoint. The belief that pyelitis is much more common in girls than in boys is not, according to Robertson, altogether borne out by evidence from post-mortem figures, but since pyelitis tends to be more serious in boys than in girls, autopsies may not give a fair indication of sex incidence. In infancy, however, the mortality among girls is certainly not lower than that among boys. Of 105 cases of pyelitis in infants at the Harriet Lane Home, the death-rate is given as 60 per cent. girls and 40 per cent. boys. Dr. Robertson is inclined to believe that the symptoms of many cases of pyelitis are due to a focal suppurative nephritis. The subject needs more attention, for the association between pyelitis and inflammation of other sections of the urinary tract remains obscure. A large series of pyelograms might help to throw some light on the ætiology of the condition, and since they also may provide some guidance to treatment, they should be taken in all intractable cases of chronic pyelitis.

THE WHEATLEY MEMORIAL.

James Wheatley had a vivid and noble conception of the health service, and his recent death was a loss to public medicine which it may be hard to make good. He was frankly concerned less with the care of sick and abnormal persons than with work which tends to improve the vitality of the ordinary individual. Open-air schools for subnormal children were to Wheatley just the prelude to open-air methods for the school population. The risk of a few accidents should not, he held, interfere with the health and vigorous development in body and mind of the people as a whole, and when he watched German children swimming in the Rhine he thought of the resulting improvement in their health and physique and not of the casualty list of accidentally drowned. Indoor swimming-baths he looked upon simply as places for teaching swimming and for amusement; in the utilisation of our rivers for bathing and open-air swimming he saw a great forward movement in public hygiene. It is therefore peculiarly fitting for his colleagues in the public health service to perpetuate Wheatley's memory by the provision of a floating swimming-bath on the river Severn near to the town of Shrewsbury, whose health was his lifelong care. From the further side of the raft swimmers will have direct access to the river, while on the hither side there will be, pace Wheatley's gospel of living dangerously, a safe and sheltered bath for non-swimmers and children, with two screened lawns on the adjoining shore where men and women respectively can enjoy sun-bathing before and after entering the water. No charge will be made for admission to the lawns or dressing sheds, but a special pavilion is to be provided for those who can afford to make payment towards the upkeep of the bath. It is hoped by the promoters of the Wheatley Memorial that this bathing-place may become a model of its kind and extend further the influence of this great sanitarian in bettering the health of the people. The estimated cost is £2000, of which an anonymous donor has given £250; contributions may be sent to Dr. A. D. Symons, at 74, Wyle Cop, Shrewsbury.

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[1] Cmd. 3185. H.M. Stationery Office. 5s.

[1] Jahrb. f. Kinderh. 1928, cxx., 253.

[2] Med. Jour. Australia, June, 1928, p. 770.

INVESTIGATIONS ON PUERPERAL FEVER.

THE annual report of the Metropolitan Asylums Board for 1927–28 contains a valuable section on the investigations carried out on cases of puerperal fever admitted to their hospitals. The pathological side of this work is under the care of Dr. Leonard Colebrook. His report is in agreement with the views now generally held with regard to the causative organism of this disease—i.e., that nearly all severe cases of puerperal fever are due to infection by a hæmolytic streptococcus. In every fatal case investigated by him this organism was found and appeared to be the cause of death. A technique has been evolved by which the number of organisms present in the circulating blood can be estimated quantitatively. In fatal cases the number of streptococci per c.cm. of blood was found to increase in a more or less regular fashion until death, the number of organisms found in the blood varying between 5 and 5000 per c.cm. Only one patient survived in whom the number of streptococci exceeded 30; of those in whom the number was below 30, one-quarter lived. Contrary to the general views on the causation of rigors, the blood was often found to be sterile when rigors occur, repeated blood cultures proving negative. At the present time much attention is being directed to the association between the streptococcus of scarlet fever and the streptococcus of puerperal fever. Dr. Colebrook points out that there is one great difference between these two diseases. In scarlet fever the symptoms are the result of the action of an exo-toxin, whereas in puerperal fever the cause of the symptoms is the presence and proliferation of streptococci in the tissues and in the blood. He considers, therefore, that treatment of the two diseases should be on fundamentally different lines. In scarlet fever an antitoxin is required, whilst in puerperal fever antibacterial measures are called for. Post-mortem examinations revealed the fact that in most fatal cases gross septic foci were to be found in the uterine wall, broad ligaments, or pelvic cellular tissues, as well as infected clots in veins. It is difficult to see how any drug could reach such sites in sufficient concentration to be effective. Hope for the future appears to rest in early treatment by some efficient bactericidal agent. Four lines of treatment have been investigated: immuno-transfusion, passive immunisation by serums, intravenous administration of mercurochrome, and intravenous administration of organic arsenical preparations. In some of the patients who survived no specific treatment was carried out. Immuno-transfusion is now performed with whole blood. A preliminary leucocytosis is induced in the donor by the injection of nuclein. On the whole, the results have not been as good as had been hoped. If a high degree of immunity can be induced in the donor against the specific organism, better results may ensue. Various samples of serum from different laboratories have been tested. The result of this work is largely negative; very little increase in the bactericidal properties of human blood against hæmolytic streptococci was found. Mercurochrome was found to have no effect on the bactericidal power of the blood.

Arsenical drugs cause a marked increase in the bactericidal powers of the blood, and Dr. Colebrook considers this to be a most hopeful line for further investigation. Unfortunately the results obtained clinically do not confirm this optimism, since elsewhere in the report Mr. James Wyatt declares that the various organic arsenical preparations have had little or no effect on the course of the disease in cases of septicæmia. It is interesting to note that in 6 out of 22 cases operated upon for general peritonitis no vaginal examination had been made.

OBVIOUS AND OBSCURE INFECTIONS OF THE CENTRAL NERVOUS SYSTEM.

THE existence of epidemic diseases of the central nervous system is now well established, and the epidemic incidence of cerebro-spinal fever, poliomyelitis, and encephalitis has been memorable in the records of the first quarter of the twentieth century. In the George M. Kober Lecture, delivered on March 27th, 1928, at Georgetown University, Washington,[1] Dr. Simon Flexner reviews the history of these diseases and offers interesting comments on their ætiology and epidemiology. The large epidemic wave of cerebro-spinal fever which broke over Europe and America in 1904–05 and culminated in the pandemic of the war-period, appears to have spent its force and since 1920 the incidence of the disease has been endemic rather than epidemic. It is possible that emigrants from Germany and Austria conveyed the infection to the United States. The origin of epidemic poliomyelitis may be traced to north-western Europe—especially Sweden and Norway—and here again Dr. Flexner believes immigration to be responsible for the conveyance of infection. The first two outbreaks of poliomyelitis in the United States occurred on the eastern coast and in the States adjoining Minnesota, the western homeland of the Scandinavian emigrants. The outlook for this disease is less favourable than for epidemic meningitis. It arose in pandemic form in 1906–07; with many fluctuations epidemics have since recurred in Europe and the United States in late summer and autumn. In 1916 an unprecedented wave of poliomyelitis swept over New York State in which more than 20,000 cases were reported and many more cases, paralytic and non-paralytic, probably occurred. In 1926 outbreaks of some magnitude occurred in England and France, and in 1927 German Saxony, Roumania, and the United States were attacked. Epidemic encephalitis, the third disease which has reached epidemic proportions in the present century, can be traced back to two relatively small outbreaks during the war, one at Bar le Duc, in France, in 1916, the other in Vienna in 1917, which was well described by Economo. The extension of the disease was rapid. It appeared in England and Wales in 1918 and affected much of Europe. In 1919 cases were seen in the United States, and by 1920 the disease had become pandemic, whether permanently or not, Dr. Flexner is unprepared to say. He inclines to the view that epidemic encephalitis is of recent origin. The theory that it was confused in the past with other maladies does not appeal to him, not only because the clinical manifestations are very impressive, but because he considers that the after-effects are too severe and serious to have escaped incorporation into medical history. Dr. Flexner holds that meningitis and poliomyelitis may be dismissed from connexion with influenza since their epidemics arose independently. The epidemics of influenza and encephalitis certainly overlapped, but the height of the wave of encephalitis came several years after that of the influenza wave. He points out also that clinical cases of encephalitis were absent from the records of the pandemic of influenza of 1889–92. As to ætiology cerebro-spinal fever is due to the meningococcus, and the researches of Dr. Flexner and his collaborators at the Rockefeller Institute have demonstrated that poliomyelitis is due to a filter-passing virus. Epidemic encephalitis is probably due to a similar virus. Dr. Flexner reviews the work on the herpes virus and concludes that it is unlikely that simple herpes and epidemic encephalitis have a common ætiology. Accumulated evidence indicates that all these nervous epidemics are man-borne infections spread chiefly by way of the respiratory tract. Dr. Flexner expresses no definite opinion on post-vaccinal encephalitis, holding that its exact ætiology is still obscure.

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[1] Jour. Amer. Med. Assoc., July 7th, 1928.

PURER RIVERS.

THE first report of the Joint Advisory Committee on River Pollution is a businesslike and unanimous document. The law, it seems, is not inadequate to prevent contamination, but the law is not enforced. Serious and avoidable pollution exists, says the Committee, partly because the jurisdiction of the various administrative authorities is confined to a particular area only, partly because the bodies which ought to enforce the law have a number of other more pressing duties to discharge, and partly because the game-keepers are also poachers. The prevention of pollution should be in the hands of an authority exercising jurisdiction over the river as a whole (including its tributaries) at any rate so far as non-tidal waters are concerned. The creation of rivers boards or joint committees for this purpose is already possible under the existing law. Under Section 14 of the Local Government Act of 1888, the Ministry of Health can set up such bodies by Provisional Order on the application of the county councils and county borough councils concerned. The report recommends that this existing provision be specially brought to the notice of all these councils. There is reason to believe that the necessary applications to the Ministry of Health would then in many cases be made, and an important step would have been taken towards the ideal of purer rivers. The rivers Thames and Lee are controlled by special statutory Conservancy Boards with which the report does not propose to interfere. The powers of these two bodies, so vital to the water-supply of the metropolis, are already greater than the ordinary powers given by the River Pollution Acts. Indeed the methods employed by the Metropolitan Water Board for treating Thames water have, both in respect of finance and purification, been so successful as to encourage recourse to river water for domestic supply, and have been officially praised in the recent annual report of the Ministry of Health. Elsewhere, it is recommended, the Rivers Board areas should be big enough to make sure that skilled officers can be employed, and not so big as to make it impossible for the chief officers to keep themselves thoroughly informed of the existence of any pollution and the best means of prevention. Since effluents and local conditions vary, the problem is best dealt with by local effort, though central research must be pressed forward and results made generally available. The report is evidently impressed by the efficiency and economy of the three group-bodies which are already at work—the Ribble Joint Committee, the Mersey and Irwell Joint Committee, and the West Riding of Yorkshire Rivers Board. Though these bodies have power to take legal proceedings against offenders, legal process apparently is resorted to only in extreme cases. In most instances, advice and persuasion are found effective, and it seems to be happily the fact that the relations between the Rivers Boards, fishery boards, local authorities, and manufacturers are cordial and mutually helpful. It is obvious that this is not the time when Parliament can be asked to pass fresh legislation which may place further burdens upon industry. The figures of cost for efficient treatment of sewage in particular districts are sometimes extraordinarily high. Nevertheless, it is reassuring to find that much can be done under the existing law, that needless, wilful, and remediable pollution can be prevented without interfering with hard-pressed industries, and that there is evidence of a keener popular interest in the purity of our rivers than heretofore. Wider changes in the law and a more closely coördinated study of the problems of river purity, land drainage, and water power resources may come some day. Meanwhile the Joint Advisory Committee makes some simple proposals which can be tackled forthwith. As appointed by the Ministries of Health and of Agriculture and Fisheries, the Committee is fully representative of local authorities, water and rivers boards, and the manufacturing, fishing, and agricultural interests. Its report carries the greater weight on this account, especially as it has achieved unanimity.

THE PATHOGENY OF ANGINA PECTORIS.

ANGINA has always been somewhat of a stumbling block to the morbid anatomist, the autopsy findings are so varied and at times so inadequate. A number of distinguished physicians, including Allbutt in this country, Vaquez in France, and Wenckebach in Vienna, have found in aortitis an explanation of the symptoms, but aortitis could only act by producing a temporary rise in blood pressure during the attack—an assumption which is by no means proved. Mackenzie's theory that the pain is attributable to exhaustion of the heart muscle is also unsatisfactory. Anatomical evidence in many cases is in favour of coronary disease being the determining factor, but this is not invariably present, and in recent years there has been a tendency to abandon the anatomical in favour of a physiological explanation which will account for the varied post-mortem findings. The evidence in support of the physiological hypothesis that angina is due to anoxæmia of the heart muscle is well presented in a recent paper by C. S. Keefer and W. H. Reznik,* who, following Heberden's original description, define angina as a condition characterised by pain of a paroxysmal nature provoked by an increase and relieved by a diminution in the demand made upon the heart. They add that the diagnosis of angina should always imply the likelihood of sudden death. The similarity of the pain in angina to that in intermittent claudication, as well as the experimental evidence that voluntary muscles which are made to contract when their blood-supply is defective are easily fatigued, and that the contraction is accompanied by pain, strongly supports this hypothesis. Further, it is well known that anoxæmia is an important predisposing cause of ventricular fibrillation. This fact will account for the frequency with which sudden death is liable to occur in these cases. In affording an explanation of the persistence of the pain in coronary thrombosis the physiological hypothesis is equally satisfactory; for in that condition, unless the anastomoses be sufficient to compensate for the occluded artery, the anoxæmia is permanent and leads to infarction.

THE PARATHYROIDS AND BONE UNION.

MUCH attention has been paid of late to the significance of the parathyroids in metabolism, but experimental work has not yet thrown much light on clinical application. The work of Collip [1] and others has demonstrated that an extract can be obtained from these glands which can overcome the syndrome of tetania parathyreopriva with its attendant low blood calcium. The injection of active parathyroid extracts may in animals even lead to fatal results accompanied by very high blood-calcium values. The older observation of Koch [2] that methylguanidine appears in the urine of parathyroidectomised dogs, and of Paton [3] and his co-workers that the injection of guanidine and methyl-guanidine in animals leads to tetany-like symptoms gave rise to the theory that the parathyroids formed a part of the detoxicating mechanism of the body. The view more generally held to-day is that the parathyroids exert some at present unknown influence on calcium metabolism. Efforts have consequently been made to work out their relationship to bone metabolism, particularly from the clinical aspect of the healing of fractures. It was as long ago as 1907 that Erdheim [4] first reported experiments on rats which showed that, as a result of parathyroidectomy, the teeth lost their yellow transparent appearance, and became white and opaque. He noted also that there was a diminished and delayed deposition of calcium in the dentine, and that the enamel was decreased or thin or lacking. Hohlbaum [5] and others confirmed these results as well as Erdheim's further contention that reimplantation of the glands restored the teeth to normal. Other observations of Erdheim's,[6] however, to the effect that parathyroidectomy caused delay in the healing of fractures were not substantiated by Hohlbaum, or by Jovane and Vaglio,[7] or by Korenchewsky.[8] The latter pointed out that Erdheim's experiments were vitiated by lack of dietary control. Other workers, however, have supported Erdheim's conclusions. Ogawa,[9] for instance, investigated the relation of these glands to the healing of fractures, and reported that union was slower after their removal. Dieterich [10] also found that this operation delayed callus formation, though X ray and histological examination proved that otherwise the process was normal in every respect. Morel [11] found in cats a marked retardation in the formation of callus after parathyroidectomy, but only in young animals and not in adults.

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* Arch. Intern. Med., 1928, xli., 770.

More recent work has, however, called in question some of the older experiments. Gates and Grant (1927)[12] have demonstrated fairly conclusively that subtotal removal of the parathyroids creates a deficiency which is rapidly compensated by hypertrophy of the remaining tissue, and that the blood calcium is restored to normal in a week to ten days. Anything short of complete removal therefore is not a reliable test of under-function of the tissue after this period of time. Until recently few observations have been made as to the effect of parathyroid extracts on the metabolism of bone, apart from scattered statements in the literature referring to its use in abnormal cases. There is some doubt, however, as to the activity of the extracts employed in these cases, for it is only since Collip isolated the active principle of the gland that definitely active preparations have been available. Morel, however, in 1909, claimed that subcutaneous injections of a parathyroid extract in young animals produced bones of twice the thickness of those in controls, regardless of the amount of calcium in the food. Recent experiments with Collip's extract do not support his work. Fine and Brown, working at Harvard, have published [13] the results of their experiments on bone repair under the influence of the extract, and their conclusions are in startling contrast to Morel's. They conclude that the clinical use of the extract for delayed bone union is not based on any sound principle, can do little if any good, and in fact may do harm. The number of their experiments, however, was small. The whole question of the relationship of the parathyroids to bone metabolism is still sub judice, and requires more extensive research before any definite conclusions can be arrived at.

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STANDARDS OF ATMOSPHERIC POLLUTION.

IN the thirteenth report of the Advisory Committee on Atmospheric Pollution, to which reference has already been made, there is an interesting suggestion of the possibility of setting up limits or standards of permissible pollution. In the report the cities have been classified according to a scale of increasing pollution into four classes—A, B, C, and D. A table for the years 1914–15 to 1926–27 indicates a tendency towards improvement in many places, but unfortunately this improvement, as we have pointed out, is rather in the moderately clean than in the very dirty cities, which show little change. The important point is, however, that a step has been taken towards setting up some standard of clean air. The places classified *A* may be called clean, while the *D's* are certainly dirty. With the information now becoming available it should shortly be possible to take a most important step from a public health point of view—namely, to set up a standard of clean air, a condition of the air of a city which is to be aimed at and is reasonably attainable. So far only a standard for deposited impurity has been suggested; the limits of permissible suspended dust still remain to be fixed. Those who are engaged with these standards would find their work simplified if reliable information could be obtained as to the minimum requirements of sunlight, and especially of ultra-violet light, for healthy living. This would be a first step towards fixing limits of smoke pollution which could not be exceeded without detriment to the health of a city.

DARWIN'S KENTISH HOME.

AN announcement made at a meeting of the General Committee of the British Association in Glasgow in respect of the destination of Down House, Darwin's home in the county of Kent, is of real interest to the medical profession, when we remember the fundamental revolution in our philosophy and endeavour that has followed upon Darwin's work. Mr. Buckston Browne having acquired the property from Prof. Charles Galton Darwin, F.R.S., grandson of the great naturalist, has transferred its possession to the British Association under the most liberal conditions, and with an endowment for its maintenance and preservation. Mr. Buckston Browne's public spirit and generosity which have before now obtained publicity in spite of his retiring manner of doing good, are marked, as on the previous occasions, by conditions which are calculated to extract from his open-handed action the fullest benefit. He has assured the Council that he will make himself immediately responsible for the whole gift, and that while a committee will have to consider the details, he will also furnish an endowment fund, bringing his donation up to the splendid sum of from £12,000 to £15,000. Sir Arthur Keith, President of the General Committee of the Association, has suggested that out of the endowment fund money should be expended upon the foundation of a prize to be given every second year for the best contribution to biological knowledge, to be awarded by the Council, and to be known as the "George Buckston Browne Prize." For the moment Down House serves as a private school, but as soon as the property can become an effective gift to the nation Mr. Buckston Browne desires the house to be open every day of the week between the hours of 10 and 6 without charge, while the grounds of the house, which are of considerable extent, he intends should be employed for the benefit of science. Further, certain of the rooms in the house, particularly that in which so much of the "Origin of Species" was written, he proposes should be furnished as nearly as possible in accordance with their old appearance, and already this project is in process of fulfilment through the cordial help of the Darwin family, without which, it should be said, the new ownership of the property could not have been obtained. Charles Darwin's study chair and his machine for the weighing of letters and parcels have already been given by the late Mrs. Litchfield, a daughter of Charles Darwin, and the British Association is desirous of securing, for the transformation of the house into a veritable Darwin memorial, any articles known to have been in the possession formerly of Charles Darwin or to be associated with his literary work. Mr. Buckston Browne has commissioned the Hon. John Collier to paint replicas of the well-known portraits of Darwin and Huxley, and when the shelves of the old study are filled with all the editions of Darwin's works and the collections of original documents pertaining to these works, Down House will become a centre of research into the origin and development of the greatest intellectual movement the world has ever seen. The association of Down House with Charles Darwin and his family is extremely close. The property was presented to him by his father in 1842, three years after his marriage. His two elder children were born before the arrival at Down, but Mrs. Litchfield, and the four distinguished sons, George, Francis, Leonard, and Horace, were born at Down House. Charles Darwin died exactly 40 years after taking up his residence, in the seventy-fourth year of his age. There has probably never been one house associated with such a record of live and permanent work, brilliant in its scientific aspect and limitless in its power for good.

SAFETY AND HEALTH IN INDUSTRY.

Several points of interest to safety and health are presented in the latest annual report of the Chief Inspector of Factories.[1] First, reference is made to the opening of the Home Office Museum in Westminster where examples of good practice in safety appliances and hygienic environment are displayed. Next stress is laid on efforts to extend safety-first organisations throughout factories with workmen's committees and safety supervisors. Examples are given of excellent results attained and much expense on account of accident compensation saved. Attention in the section devoted to purely medical matters is directed to the Lead Paint (Protection against Poisoning) Act, 1926, under which the house painter is now protected. Information was received of 98 cases of lead poisoning among these painters with 21 deaths, as compared with 249 cases in all other industries with 14 deaths. Clearly the case fatality is much higher among painters. The long fight in the potteries against plumbism is being rewarded; last year only 14 cases with six fatalities occurred, compared with 78 cases in 1910 with 11 deaths. The extended use of low solubility glaze is held to be largely responsible; among 554 workers using this glaze, not one was found with signs of lead poisoning. But lead is being replaced as an occupational risk by skin troubles and particularly by epitheliomata which again accounted for 49 deaths. Pitch and tar are great offenders and caused 48 cases with 6 deaths; here periodical medical examinations to detect warts early are of the utmost value; one surgeon gives all early cases radium and only one case out of 56 has so resisted treatment as to require excision. But the chief instigator has been mineral oil which claimed 101 cases among mule-spinners with 31 deaths; preventive measures among these men have not been in force sufficiently long to be effective. Dermatitis of all kinds continues to demand attention; 525 cases were referred for inquiry. Of these, 13·7 per cent. were due to alkalies; 11·2 were due to oil, chiefly oil acne among engineers; dyes, acids, sugars, and turpentines each accounted for over 6 per cent.; french polish and paraffin each claimed over 5 per cent.; bakers' dough 4 per cent.; and accelerators of rubber 3·6 per cent. Another rival for first place among occupational risks is dust; here that composed of silica attracts particular attention on account of its slow, but specific, toxic action. Fortunately in the metal grinding industry, abrasive wheels, made of carborundum, are replacing sandstones; this change is being accelerated by granting to grinders compensation for silicosis. An inquiry among 1011 cotton weavers disclosed 6·7 per cent. had noise deafness, and 19·4 per cent. of those who had worked for 21 years and over. An important first-aid order was made prescribing a grade or quality for all materials for dressings used in factories. Reviewing the report as a whole it displays throughout a greatly improved and still improving hygienic environment throughout our industries.

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[1] Annual Report of the Chief Inspector of Factories for 1927. Cmd. 3144. H.M. Stationery Office. 2s. 8d.

HYPERTONIC SALT SOLUTION FOR GLAUCOMA.

In recent years much stress has been laid on osmosis occurring between the capillaries and the aqueous humour as a factor in the maintenance of normal intraocular pressure and in the pathogenesis of glaucoma. In 1926 W. S. Duke-Elder published experiments proving that intraocular tension can be temporarily lowered by the slow intravenous injection of a hypertonic solution of salt into the general circulation, and advocated this procedure in certain cases of glaucoma as a temporary measure to reduce tension prior to operation. This method had already been tried with success in four cases at Moorfield's Hospital. In the report of the Madras Government Ophthalmic Hospital for 1927, edited by Lieut.-Colonel R. E. Wright,[1] there is further evidence bearing on the subject. A series of 20 cases of glaucoma patients were taken without selection, so far as the variety of glaucoma was concerned. Their body-weight, blood pressure, intraocular tension, and a sample of blood were taken before saline injection, and again at intervals afterwards. The hypertonic solution was injected slowly into a vein of the arm—30 g. per 100 c.cm. of sodium chloride, the dose given being in most cases 20 c.cm., which worked out to an average of 0·134 g. of sodium chloride per kilogram of body-weight. Within 15 minutes of giving the injection the average fall of intraocular tension was from 46·7 to 34·2, and this fall was maintained with slight variations for 24 hours. The writer concludes that therapeutically the injection of strong sodium chloride solution is a valuable means of lowering the intraocular tension, effective in the great majority of cases, and especially valuable as a preoperative procedure; but cautiously adds that it remains to be shown whether the fall in intraocular tension is more closely connected with the osmotic pressure or with other changes in the constitution of the blood. Lieut.-Colonel Wright's conclusions are much the same as Mr. Duke-Elder's.[2] The main danger, according to the latter authority, is a sudden fall in the blood pressure which may occur during the injection, but this is obviated if the injection is made slowly and regularly, with a patient in the recumbent position.

The Clinical Congress of the American College of Surgeons is held in Boston this year from Oct. 8th to Oct. 12th. The Hunterian Oration of the College will be delivered by the Editor of The Lancet, Sir Squire Sprigge, upon whom the Honorary Fellowship of the College will be conferred.

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[1] Madras Government Press, 1928.

[2] Recent Advances in Ophthalmology, p. 211.

University College Hospital.—The annual dinner of past and present students in this the centenary year of the Medical School will be held at the Hotel Cecil, London, W.C., on Oct. 12th, at 7 P.M. The chair will be taken by Surgeon Vice-Admiral Gaskell, Medical Director-General of the Navy. Tickets may be had on application to the hon. secs. at the Medical School.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

III.—REPORTS ON SWABS FROM THE THROAT AND NASAL PASSAGES.

By J. E. McCartney, M.D., Ch.B., D.Sc.,
DIRECTOR OF RESEARCH AND PATHOLOGICAL SERVICES, METROPOLITAN ASYLUMS BOARD.

(2) Cases not Suspected of Diphtheria.

Spirochætes and Fusiform Bacilli.

The examination of a direct smear of the swab after staining with dilute carbol-fuchsin or methyl-violet will determine or negative the presence of Vincent's angina. Microscopically, numerous large fusiform bacilli with pointed ends, together with spirochætes aving wide irregular coils, may be found, and this is ufficient for a diagnosis. It must be remembered hat Vincent's angina and true diphtheria may occur gether and that an immediate report of Vincent's ngina does not exclude the possibility that diphtheria may be present as well. In the laboratory all throat swabs are cultured and examined for diphtheria bacilli as a routine, irrespective of the direct examination, so there is no danger of the more serious disease of diphtheria being overlooked.

Hæmolytic Streptococci.

Throat swabs are sometimes sent to the laboratory to ascertain if hæmolytic streptococci are present in cases of convalescent scarlet fever patients ready for discharge. Although the hæmolytic streptococcus plays an important part in scarlet fever, the presence of these organisms does not mean that the patient is capable of transmitting the disease, or that the streptococci found are necessarily the cause of the illness. Over one-half of convalescent scarlet fever patients still harbour hæmolytic streptococci on discharge. Although certain strains of hæmolytic streptococci isolated from early cases of scarlet fever do fall into certain serological types, yet the whole group of hæmolytic streptococci are so closely interrelated that it is not possible to identify any one type or types as the cause of scarlet fever. Therefore a positive report of hæmolytic streptococci present in scarlet fever does not have the same significance as a positive report of diphtheria bacilli in convalescent diphtheria, and does not mean that the patient is necessarily infective or that he must be kept isolated. The release from quarantine of recovered scarlet fever cases must be determined solely from the consideration of the patient by the physician and not with reference to the laboratory report, although, of course, a negative result in such cases is of great assistance in arriving at a decision.

Meningococci.

In the usual examination of a throat swab, meningococci are not specially looked for. If, however, there s an epidemic, or cases of meningitis are occurring at he time, the bacteriologist will pay special attention to the Gram-negative group of cocci found in the nasopharynx and throat, and will usually determine or exclude the presence of meningococci without being definitely asked to do so. Special laboratory tests extending over several days are necessary to isolate meningococci; if they are found to be present the patient must be regarded as a meningococcus carrier and treated accordingly.

In examining for meningococcus carriers it is not advisable for the practitioner to take a throat or postnasal swab and send it to the laboratory; the bacteriologist should be asked to take the swab himself. In the first place special postnasal swabs such as West's swabs should be employed, and secondly, owing to the feeble vitality of the organism outside the body, it is necessary to inoculate the appropriate medium immediately, and to incubate it without delay, or to keep it warm until it can be placed in the incubator. Unless these precautions are taken no reliance can be placed on a negative report. Three successive negative reports are necessary before a known carrier can be considered free of infection.

The Normal and Pathological Flora of the Tonsils and Upper Respiratory Tract.

When considering the organisms present in cases of catarrh or other inflammatory conditions of the throat the normal flora must first be considered. In normal healthy children the commonest throat organisms are the "viridans" type of streptococcus, and Gram-negative cocci of the *Micrococcus catarrhalis* group, which are almost constantly met with. In addition, a few colonies of both α and β hæmolytic streptococci, together with some colonies of staphylococcus albus, are usually present. Occasionally Friedländer's bacillus and the pneumococcus are noted. In inflammatory conditions of the throat, however, the flora becomes very much more numerous, and certain organisms, rarely or never met with normally, such as pneumococci, *Staphylococcus aureus*, hæmophylic bacteria of the *B. influenzæ* type, and diphtheroids may predominate, while hæmolytic streptococci may be very abundant.

In cultures from the throat of the healthy child the growth of organisms is not great, and the number of bacteria present in the throat secretion is comparatively small. In his report the bacteriologist will indicate the predominating organism and the relative frequency. Reports such as the following indicate that there is an abnormal change in the flora of the throat, and that the condition requires attention by the practitioner.

(*a*) "Cultures show an abundant growth of an almost pure culture of pneumococci."

While pneumonia is usually due to the pneumococcus, such a report does not necessarily indicate that the patient either has, or will develop pneumonia. A pneumococcal infection of the throat or trachea ma be present, but in young children the possibility pneumonia must not be overlooked. Careful attentio should be directed towards the chest, and the possibl spread of infection down the respiratory tract must be kept in mind.

(*b*) "Very numerous colonies of hæmolytic streptococci present."

Here attention should be paid to the tonsils as the likely site of the infection.

(*c*) "Numerous colonies of *B. influenzæ* developed on blood-agar."

This report does not necessarily mean that the case is true influenza, since the precise cause of epidemic influenza has not yet been determined. *B. influenzæ* is met with in catarrhal conditions of the respiratory tract apart altogether from this condition.

(*d*) "Cultures show an abundant growth of organisms comprising hæmolytic streptococci, pneumococci, *M. catarrhalis*, and *Staphylococcus aureus*."

These findings are usually noted in cases of sore-throat and "colds."

On the other hand, a report such as—

"In direct films very few organisms could be found. In cultures a few colonies of *M. catarrhalis* and *Staphylococcus albus*, together with an occasional colony of *Streptococcus viridans* developed"

indicates that the flora is normal and that the throat is healthy.

Septic Foci in the Rheumatic Diseases.

Chronic Catarrhal Conditions of the Nose and Throat.—In these cases, particularly if involvement of the sinuses is suspected, swabs should be taken from the nose as well as from the throat, while a swab from the nasopharynx should also be forwarded if possible. This latter may be obtained by bending the wire of the swab at an angle and passing the end of the swab behind the soft palate into the naso-pharynx. The operation is facilitated if the patient be asked to phonate during the process. Vaccines are often of use in these conditions, particularly when one type of organism predominates. but failures are not uncommon.

Septic Tonsils.—Swabs from the tonsil are sometimes sent to the laboratory with a request for information as to whether the tonsils should be removed or not. Such a problem as this is outside the domain of the bacteriologist. He can state what organisms are present and their relative abundance in the material submitted; he may indicate whether such findings are abnormal, but beyond that he can give no help. He does not know how the swab was taken—whether from the surface of the tonsils or from the crypts. The report of the bacteriologist may assist the practitioner in arriving at a decision for or against tonsillectomy, but this must be reached mainly on clinical grounds.

The laboratory worker is frequently asked to give information regarding certain clinical conditions merely from the bacteriological examination of a throat swab, and it is opportune here to indicate the limitations of the information which can be supplied.

Acute Rheumatism.—Clinical experience suggests a connexion between rheumatic conditions in children and an abnormal state of the tonsils. At present it is not possible to state definitely what the causal organism of rheumatism is. A non-hæmolytic streptococcus has been thought by some observers to be responsible, but the isolation of such an organism from the tonsils has no special significance, since non-hæmolytic streptococci are almost invariably present in all throats, and, moreover, the non-hæmolytic cocci from rheumatic cases are indistinguishable by ordinary methods from similar organisms obtained from non-rheumatic conditions or healthy individuals.

Chronic Rheumatism and Rheumatoid Arthritis.—On the assumption that these conditions are due to a septic focus, often in the nose or throat, swabs are sometimes sent to the bacteriologist in order that he may isolate the offending organism and prepare a vaccine. Here again no one organism can be said to be responsible, and while some workers claim that certain types of streptococci are the cause of these conditions, nothing is definitely proved. A vaccine prepared from a certain organism may be beneficial to the patient, while the same organism may be present in a second case, and a similar vaccine be of no value. Some cases of chronic rheumatism do respond to vaccine treatment, but there are many others, apparently similar clinically, in which no benefit can be derived, even after a course of vaccines prepared from a number of organisms isolated from the nose, throat, or teeth. The practitioner therefore should realise: (*a*) that there is no one organism responsible for chronic rheumatism, or rheumatoid joint conditions; (*b*) that a vaccine or succession of vaccines prepared from cultures of a throat swab may fail to benefit the condition.

CONCLUSION.

In conclusion, it is urged that a greater coöperation should be maintained between the physician and the bacteriologist. The latter should be afforded full information as to the nature and source of the material submitted, and in turn he will be able to give the clinician more assistance in the diagnosis and conduct of the case.

GOLDEN-SQUARE, THROAT, NOSE AND EAR HOSPITAL. This hospital, which is within easy reach of Piccadilly-circus, is about to open 20 pay beds. These will be available at a moderate weekly charge, plus a fee to the surgeon, for those patients who are not eligible for admission to the general wards, but who are nevertheless unable to meet the expenses of a nursing home. A prospectus relating to the private rooms will be sent on application to the Secretary-Superintendent.

Special Articles.

AN OUTBREAK OF BACTERIAL FOOD POISONING.

BY JOHN McGARRITY, M.D. EDIN., D.P.H.,
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DEPUTY MEDICAL OFFICER OF HEALTH, CARDIFF;
AND
JOHN H. SUGDEN, M.Sc., F.I.C.,
CHEMIST AND BACTERIOLOGIST, CARDIFF AND COUNTY PUBLIC HEALTH LABORATORY.

DURING the night of Tuesday, August 16th, 1927, and throughout the 17th and 18th, 12 nurses, 1 maid, and 25 patients in a hospital were suddenly seized with vomiting, abdominal pain, and diarrhœa, usually accompanied by fever and preceded in many cases by headache, shivering, and aching pains throughout the body. The symptoms were in all respects typical of food poisoning, and in most cases lasted for three or four days, gradually abating. In a few instances the green stools persisted for about ten days. Onset occurred in the case of the nurses during the night and early morning of August 16th–17th and of the patients during the 17th and 18th. The sudden and simultaneous sickening of several people with these symptoms made a diagnosis of food poisoning almost certain.

The Infecting Agent.

The Particular Food Implicated and the General Distribution of the Outbreak.—On investigation it was found that the only item of food common to all those affected was minced meat—cooked meat minced and cooked a second time. Most of the nurses and maids in the hospital, who, it should be noted, have no food in the wards, had partaken of this minced meat for supper on Monday evening, August 15th, in the form of shepherd's pie. Of the 18 day nurses 12 were affected and three of the six who were unaffected did not have mince. Only one maid had mild symptoms. The sisters had no mince and escaped. Of the 56 patients in the wards 25 were affected; 21 of them had the same mince on Monday, August 15th, and Tuesday, the 16th, at the midday meal, while four had gravy from the same meat. Only one ward inmate who consumed the mince and two who took the gravy escaped. In all cases where symptoms arose the food had been last taken within about 24 to 36 hours previously. The meat, as originally cooked and served hot, was consumed by almost all the hospital staff without untoward effect. Also, no effects followed the eating of the same meat served cold. It was not until this meat was served in the form of mince or gravy that symptoms of food poisoning followed. The high percentage of infection of the ward inmates and day nurses will be noted, in contrast with the immunity of the night nurses and maids.

Composition of the Mince.—Unfortunately none of the mince was available for bacteriological examination when the outbreak was discovered. The utensils which had contained it had also been cleaned more than once. The chief constituent of the minced meat was beef brought to the hospital on Saturday, August 13th. There was also some lamb and salted beef. The beef and lamb were first roasted, and a portion of each consumed hot; a portion was also eaten cold later. The portions that remained were minced, a few scraps of salt beef being added during the mincing, and the mince, so constituted, was served with gravy to the children at midday on Monday, August 15th. The same mince was eaten by the nurses and maids that night for supper. Some of the mince was again served with gravy to some of the children on Tuesday. So far as was known no old scraps of meat of any kind were incorporated in the mince by the cooks.

Contamination of the Meat.—The beef, from which the mince was almost entirely derived, was traced back to a live beast reared at a local farm. The beast was healthy, and its flesh gave no sign of disease post m[illegible] in the public abattoir, conveya[illegible] butcher's premises, and in the [illegible] handling and preparation generally were carried out under conditions unfavourable to casual contamination. Other portions of the carcass were sold retail to the public without causing any illness which could be traced by the most careful inquiry. It must be remembered, however, that odd scraps of mutton and salted beef were thrown into the mincer and their varied origins were untraceable.

Possibilities of Infection in the Hospital from Human Sources.

J. M., a porter, had diarrhœa during the night of August 11th–12th. This continued for several days, but was not sufficient to cause him to go off duty. He lived in the lodge with his wife and had his meals there. His meat-supply was from a different source. This man was supposed not to get any food from the hospital supply, but he visited the kitchen precincts to help to carry the food to the wards. He had not eaten any of the mince, and, in any case, this was not made until some days after he was taken ill. The porter's symptoms started before the meat—making up the bulk of the mince—was actually delivered to the hospital, and they occurred some days previous to the outbreak among the staff and patients. The bacterial and serological findings in his connexion will be discussed later.

O. M., a nurse, was warded on August 4th as a suspected case of influenza or typhoid fever. She had symptoms closely resembling those observed in the outbreak. The fæces and blood, however, were subsequently found negative to all tests.

W. F., a nurse, was warded on August 14th. She had similar symptoms, which began with vomiting on Saturday evening, August 13th. She had not eaten any of the suspect mince and yet her blood showed a weakly positive reaction to *Bacillus aertrycke.*

Laboratory Investigation.

Epidemiologically and clinically the symptoms were in favour of an infection rather than an intoxication, and seemed to point to one of the Salmonella group of organisms. Specimens of fæces and vomited material were collected from several of the patients for examination at the Public Health Laboratory and similar samples were also sent to Dr. W. M. Scott at the laboratories of the Ministry of Health.

Laboratory Examinations at Cardiff.—On August 18th samples of stools were sent to the laboratory, collected from three of the patients—viz., A (M. P.), B (E. H.) and C (E. C.). Samples of vomit from three other patients—viz., D (M. C.), E (S. P.), and F (C. E.), were also submitted for examination. The only samples of food available which might possibly be regarded as associated with the outbreak were: (1) beef dripping, and (2) fish dripping. A bacteriological examination of these food samples for food-poisoning organisms gave negative results.

Examination of the Vomit.—Chemical examinations for preservatives and for arsenic or other poisonous metals gave negative results. From samples D and F a series of lactose bile-salt agar plate cultures gave non-lactose fermenting colonies in practically pure cultures. The fermentation characters and also the morphological and staining characters of several colonies from each of the samples were tested, and all conformed to those for food-poisoning organisms of the Salmonella group. Agglutination tests made with 24-hour agar cultures gave strong agglutination to a high dilution of *B. aertrycke* [illegible] approximating to t[illegible] *B. a*[illegible] (Mutton) used as a control. Negative results were given by cultures from both samples with standard *Bacillus enteritidis* Gaertner serum of an agglutinating titre of 100 units. The failure to isolate any food-poisoning organisms from sample E is probably to be attributed to the marked acidity of this sample.

Examination of Stools.—Samples A and B gave non-lactose fermenters, more numerous on plates after incubation with brilliant-green broth. Sample C gave negative results. A number of colonies isolated from samples A and B were fully examined, as in the case of samples D and F. The fermentation characters and also the agglutinating tests were identical with those obtained above. No absorption tests for specific organisms were made, but the results indicated a strong probability that the organism was of the *B. aertrycke* type.

Serological Tests.—On August 26th, allowing a period of ten days from the acute stage of the outbreak, a number of specimens of blood serum were collected from patients and staff. Specimens A, B, D, and F were from the patients M. P., E. H., M.C., and C. E. respectively, from whom a food-poisoning organism had previously been isolated. The sera were tested for agglutinating titre against the specific organisms and also with *B. aertrycke* (Mutton). The following were the highest dilutions showing marked agglutination:—

Serum.	Specific organism.	*B. aertrycke* (Mutton).
A	+1 in 500	+1 in 500
B	+1 in 500	+1 in 500
D	+1 in 1000	+1 in 500
F	+1 in 1000	+1 in 500

Samples of sera from two members of the staff gave weak reactions, but from three others negative results were obtained as follows:—

Serum.	Organism F.	*B. aertrycke* (Mutton).
No. 1 (J. M.), porter	+1 in 20	+1 in 20
No. 2 (W. F.), nurse	+1 in 100	+1 in 100
No. 3 (O. M.), "	−1 in 20	−1 in 20
No. 4 (E. F.), cook	−1 in 20	−1 in 20
No. 5 (E. W.), "	−1 in 20	−1 in 20

No absorption tests were made locally, but most of the above sera were examined at the laboratory of the Ministry of Health, and none showed any specific paratyphoid B agglutinin. The organisms isolated by us from cases A, B, D, and F, and also a culture of *B. aertrycke* (Mutton), were each tested for agglutination with a paratyphoid B serum up to a dilution of 1 in 1000. Organism A showed definite agglutination to 1 in 250, whilst organisms B, D, and F, and *B. aertrycke* agglutinated to 1 in 500 dilution.

Theories of Infection.

This outbreak is a good example of the difficulty often arising in tracing the origin of food poisoning even in what might appear at first sight to be the most favourable conditions. While it was possible to isolate the organism causing the infection, and to conclude from circumstantial evidence that the article of diet involved was minced meat, yet how the original meat or the mince became infected could not be determined. It is possible that the porter (J. M.) was infected from some outside source and casually contaminated the meat or mince, although no action of his could be traced which might account for the extensive contamination both of staff and patients' diets. His stools, examined rather late, were negative, but his blood was very weakly positive to *B. aertrycke.* The conduct of the institution made fly-contamination of the meat from the porter's stools or any other source unlikely, and inquiries in the district failed to reveal any cases in the households of persons supplied with the same meat as this porter. On the whole, he must be considered a very unlikely source of contamination. An interesting feature of the outbreak was that the maids of the hospital all had mince, but only one was affected, and that very slightly; neither did any of the night nurses suffer, and yet they all had the same minced meat as the day nurses. The suspect mince, however infected, was, of course, not served from one, but from several dishes. There was one dish for the day nurses, several small dishes for the night nurses, and one larger dish for the maids —all containing the mince in the form of shepherd's pie—while each ward had its own numbered dish containing ordinary minced meat and gravy. The mince may have become contaminated during mincing by the inclusion of infected portions of meat, these portions being localised in the dishes set apart for the day nurses and patients in the wards. The fact that scraps of salt beef and mutton were mixed with the wire of the swab at an angle and passing the end of the swab behind the soft palate into the naso-pharynx. The operation is facilitated if the patient be asked to phonate during the process. Vaccines are often of use in these conditions, particularly when one type of organism predominates, but failures are not uncommon.

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The laboratory worker is frequently asked to give information regarding certain clinical conditions merely from the bacteriological examination of a throat swab, and it is opportune here to indicate the limitations of the information which can be supplied.

Acute Rheumatism.—Clinical experience suggests a connexion between rheumatic conditions in children and an abnormal state of the tonsils. At present it is not possible to state definitely what the causal organism of rheumatism is. A non-hæmolytic streptococcus has been thought by some observers to be responsible, but the isolation of such an organism from the tonsils has no special significance, since non-hæmolytic streptococci are almost invariably present in all throats, and, moreover, the non-hæmolytic cocci from rheumatic cases are indistinguishable by ordinary methods from similar organisms obtained from non-rheumatic conditions or healthy individuals.

Chronic Rheumatism and Rheumatoid Arthritis.—On the assumption that these conditions are due to a septic focus, often in the nose or throat, swabs are sometimes sent to the bacteriologist in order that he may isolate the offending organism and prepare a vaccine. Here again no one organism can be said to be responsible, and while some workers claim that certain types of streptococci are the cause of these conditions, nothing is definitely proved. A vaccine prepared from a certain organism may be beneficial to the patient, while the same organism may be present in a second case, and a similar vaccine be of no value. Some cases of chronic rheumatism do respond to vaccine treatment, but there are many others, apparently similar clinically, in which no benefit can be derived, even after a course of vaccines prepared from a number of organisms isolated from the nose, throat, or teeth. The practitioner therefore should realise: (*a*) that there is no one organism responsible for chronic rheumatism, or rheumatoid joint conditions; (*b*) that a vaccine or succession of vaccines prepared from cultures of a throat swab may fail to benefit the condition.

CONCLUSION.

In conclusion, it is urged that a greater coöperation should be maintained between the physician and the bacteriologist. The latter should be afforded full information as to the nature and source of the material submitted, and in turn he will be able to give the clinician more assistance in the diagnosis and conduct of the case.

GOLDEN-SQUARE, THROAT, NOSE AND EAR HOSPITAL. This hospital, which is within easy reach of Piccadilly-circus, is about to open 20 pay beds. These will be available at a moderate weekly charge, plus a fee to the surgeon, for those patients who are not eligible for admission to the general wards, but who are nevertheless unable to meet the expenses of a nursing home. A prospectus relating to the private rooms will be sent on application to the Secretary-Superintendent.

Special Articles.

AN OUTBREAK OF BACTERIAL FOOD POISONING.

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DURING the night of Tuesday, August 16th, 1927, and throughout the 17th and 18th, 12 nurses, 1 maid, and 25 patients in a hospital were suddenly seized with vomiting, abdominal pain, and diarrhœa, usually accompanied by fever and preceded in many cases by headache, shivering, and aching pains throughout the body. The symptoms were in all respects typical of food poisoning, and in most cases lasted for three or four days, gradually abating. In a few instances the green stools persisted for about ten days. Onset occurred in the case of the nurses during the night and early morning of August 16th–17th and of the patients during the 17th and 18th. The sudden and simultaneous sickening of several people with these symptoms made a diagnosis of food poisoning almost certain.

The Infecting Agent.

The Particular Food Implicated and the General Distribution of the Outbreak.—On investigation it was found that the only item of food common to all those affected was minced meat—cooked meat minced and cooked a second time. Most of the nurses and maids in the hospital, who, it should be noted, have no food in the wards, had partaken of this minced meat for supper on Monday evening, August 15th, in the form of shepherd's pie. Of the 18 day nurses 12 were affected and three of the six who were unaffected did not have mince. Only one maid had mild symptoms. The sisters had no mince and escaped. Of the 56 patients in the wards 25 were affected; 21 of them had the same mince on Monday, August 15th, and Tuesday, the 16th, at the midday meal, while four had gravy from the same meat. Only one ward inmate who consumed the mince and two who took the gravy escaped. In all cases where symptoms arose the food had been last taken within about 24 to 36 hours previously. The meat, as originally cooked and served hot, was consumed by almost all the hospital staff without untoward effect. Also, no effects followed the eating of the same meat served cold. It was not until this meat was served in the form of mince or gravy that symptoms of food poisoning followed. The high percentage of infection of the ward inmates and day nurses will be noted, in contrast with the immunity of the night nurses and maids.

Composition of the Mince.—Unfortunately none of the mince was available for bacteriological examination when the outbreak was discovered. The utensils which had contained it had also been cleaned more than once. The chief constituent of the minced meat was beef brought to the hospital on Saturday, August 13th. There was also some lamb and salted beef. The beef and lamb were first roasted, and a portion of each consumed hot; a portion was also eaten cold later. The portions that remained were minced, a few scraps of salt beef being added during the mincing, and the mince, so constituted, was served with gravy to the children at midday on Monday, August 15th. The same mince was eaten by the nurses and maids that night for supper. Some of the mince was again served with gravy to some of the children on Tuesday. So far as was known no old a better chance of maintaining themselves, and thus keeping out of the scope of the inquiry, but even so the number of old people is rather surprising. Table II., however, makes it clear that the proportion of the insane among the older epileptics is very much higher. Nearly half of those over 50 are insane, while the incidence of insanity in the whole group is less than one-quarter.

The Authorities Concerned.

Feeble-minded children between the ages of 5 and 16 come under the care of local education authorities; feeble-minded persons of 16 or over and all imbeciles or idiots of whatever age should come under the care of mental deficiency authorities. It appears therefore from Table II. that the mental deficiency authorities have, or should have, the responsibility for 271 or 37·3 per cent. of the total number, while the corresponding figure for authorities acting under the Lunacy Acts is 162, or 22·3 per cent. The remaining 293, or 40·4 per cent. of the whole, are independent of either of these authorities. In other words, nearly one-half of all the epileptics known to the public authorities are quite outside the provisions of the Mental Deficiency or Lunacy Acts. Of these 293 epileptics, 96 are children between the ages of 5 and 16. These should be dealt with by the local education authority, and educated, as the circumstances demand, at public elementary schools, day special schools, or residential special schools. For the remaining 197 the only authority competent to give assistance or treatment would appear to be the poor-law authority.

It has been stated above that the mental deficiency authorities have, or should have, the care of 271 of the series of epileptics, or 37·3 per cent. of the total number. As a matter of fact it is found that only 49 cases are under their care, of whom 19 are in institutions and 30 not in institutions. Of all patients certified under the Mental Deficiency Acts it is probable that epileptics stand more in need of institutional treatment than any other class, and it is remarkable that three-fifths of even this small group are allowed to remain at home. Three of the 49, being feeble-minded children of school age, should really come under the local education authority, leaving a balance of 46. Where and under whose care are the remaining 225 out of the total of 271? 112 of them, all imbeciles or idiots, are in public mental hospitals, where they constitute, indeed, nearly half of the epileptic population; 108 of them are maintained by poor-law authorities, 4 are returned by maternity and child welfare committees, and 1 over school age is reported as known to a local education authority. The 108 maintained by poor-law authorities are distributed as follows:—

In epileptic institutions	47
In poor-law institutions	24
In other institutions	15
On outdoor relief	18
Boarded out	4

It will be clear, therefore, that less than one-fifth of the epileptics who should come under the mental deficiency authorities are in fact dealt with by them; the remainder are maintained in approximately equal numbers either in lunatic asylums or by poor-law authorities. It is useless to expect any alteration in this state of affairs unless and until there is very substantial increase in residential accommodation provided by the mental deficiency authorities. There are 19 epileptic imbeciles or idiots of various ages and 30 feeble-minded epileptics above school age who are not in institutions. It is probable that there are few households that can cope adequately with mentally deficient epileptics, especially those of the lower grades.

It appears that 62 epileptics of varying mental grades are dealt with in general poor-law institutions or infirmaries. Where these institutions are large and a special ward can be allotted to epileptics the arrangement may be open to little objection. But in smaller institutions, where these patients have to share wards with other inmates, it would be more desirable from their own point of view and certainly from the point of view of others that other accommodation should be provided for them, either in appropriate hospitals under the lunacy or mental deficiency authorities, or in epileptic colonies.

Children of School Age.

There are 124 children of school age in the series, of whom 67 are reported as mentally normal, 27 as feeble-minded, and 30 as of still lower grade of mental defect. Table III. shows the authorities who are dealing with these children and beside it a table showing how the children should be apportioned between the local education authority and mental deficiency authority.

TABLE III.

	Distribution.	
	Present	Suggested.
Local education authority	86	94
Mental deficiency authority	16	30
Mental hospitals	9	—
Poor-law authority	13	—

Of the 94 children who should be attending school there are:—

At elementary schools	46 (48·9 %)
At residential schools for epileptics	19 (20·2 %)
In other institutions	5 (5·3 %)
Boarded out	1 (1·1 %)
At no school or institution	23 (24·5 %)

(Of the 23 children at no school or institution 14 are mentally normal and 9 are feeble-minded.)

Conclusions.

It has been stated above that, including war pensioners, it is estimated that there are 781 epileptics known to public authorities in Surrey. If from this total of 781 we deduct 154 epileptics who are not in institutions and not in receipt of outdoor relief the balance of 627 should represent the number who are chargeable in one form or another to public authorities. This total of 627 is equivalent to 0·65 per 1000 of the population of Surrey (including Croydon).

Assuming the incidence of epilepsy to be the same throughout the country a ratio of 0·65 per 1000 of the population would give an approximate total of 25,000 epileptics chargeable to the public authorities of England and Wales. On the basis of Table II. above the age-groups and mental condition of these 25,000 would be as follows (Table IV.).

TABLE IV.

Mental condition.	Age-groups.			
	0–5	6–15	16–70 and over.	Total.
Mentally normal	277	2,498	6,475	9,250
Mentally defective or feeble-minded	90	990	3,420	4,500
Imbecile or idiot	172	1,035	4,543	5,750
Insane	—	—	5,500	5,500
Total	539	4,523	19,938	25,000

It may be suggested that the survey was made in an area in which the public authorities are unusually active and progressive, and that the figures for the whole country, could they be ascertained on similar lines, would be smaller. It is certainly true that within the county area there are three special institutions for epileptics—viz., one at Woodmansterne maintained by the Surrey Joint Poor-law Committee for sane female epileptics, a general epileptic colony at Lingfield, and the Meath Home for women and girls at Godalming. There is, however, no evidence that the incidence of epilepsy is likely to vary in different parts of the country, or that it bears any relation to industrial or economic conditions or to density of population. It is considered fair, therefore, to state that on the basis of the figures obtained by this inquiry, the number of epileptics chargeable to the meat during mincing confuses the picture. These portions may have carried the infection and accounted for its random distribution. None of these had done any damage when consumed in the freshly cooked state. As they were the surplus of several days' diet, salted and kept in the larder, it was impossible to trace them to their source.

Summary.

In an outbreak of food poisoning in a hospital affecting 12 day nurses, 1 maid, and 25 patients, an organism of the Salmonella group was isolated from the fæces and vomit of a number of cases. Direct agglutination tests indicated that the organism was a member of the group having type agglutinins for *B. aertrycke* and *B. paratyphosus* B. The absence of specific agglutinins for *B. paratyphosus* B ruled out this organism as a causal agent, apart from the clinical evidence. The organism isolated from the vomited material and stools of several patients was agglutinated by the blood sera of these patients in high dilution. These sera also agglutinated *B. aertrycke*, but failed to agglutinate other organisms, including those of the enteric group. The conclusion from laboratory investigations conducted at Cardiff, confirmed by the bacteriologist to the Ministry of Health, is that the outbreak was due to a food-poisoning organism of the *B. aertrycke* type. The infection was contained in twice-cooked meat served either as mince or gravy, but how it gained access to the meat could not be ascertained.

We are indebted to Dr. R. M. F. Picken, medical officer of health, Cardiff, for kindly permitting us to publish these notes.

A CENSUS OF EPILEPTICS IN SURREY.

THE Permanent Committee on Epileptics, a body representative of the various voluntary agencies dealing with epilepsy, has recently reported on the number of epileptics known to the public authorities in the county of Surrey. Copies of the full report, containing various classification tables, are available on application to the Secretary of the Committee, 296, Vauxhall Bridge-road, London, S.W. 1. The following is an abstract of the report.

The usual estimate of the incidence of epilepsy, as given in the text-books, is 2 per 1000 of the population. This would mean that at the present time there are some 76,000 epileptics in England and Wales, but no one can say that this is even approximately correct; still less is it possible to give with any exactness the proportion of the sexes, the ages, or the mental conditions of these epileptics.

This lack of any exact knowledge is a serious obstacle in any attempt to deal with the problem of the epileptic. It is obviously impossible to take a census of the epileptics in the general community of even a small section of the country. It occurred, however, to the Permanent Committee that it would serve a useful purpose to endeavour to ascertain the numbers of epileptics known to the public authorities of one county area, and to obtain details of their age, sex, and mental condition. It is thought that from the figures thus obtained it should be possible to form some more or less reliable estimate of the numbers and types of epileptics who come under the care of the public authorities of the country as a whole.

The area chosen by the Committee is that of the administrative county of Surrey together with the county borough of Croydon. Questionaires have been addressed to all public authorities in that area, and replies have been received from all with the exception of the maternity and child welfare committees of three of the smaller districts. It may be claimed, therefore, that the figures are practically complete for the area covered by the inquiry. So far as possible overlapping between the various authorities in the supply of information has been avoided.

The Gross Numbers.

Table I. is a summary of the cases returned by the respective authorities:—

TABLE I.

Authority.	M.	F.	Total.
Mental hospitals	127	144	271
Poor-law guardians	135	126	261
Local education authorities	65	67	132
Mental deficiency authorities	27	22	49
Maternity and child welfare authorities..	6	7	13
Totals	360	366	726

It had been hoped to include the figures of epileptic war pensioners in this census, but on inquiry it was found that it was impossible to separate the Surrey figures from those of the much larger area in which the county is included for statistical purposes by the Ministry of Pensions. It is understood, however, that there are now approximately 3000 officers and men in receipt of pensions and allowances in respect of epilepsy. The population of Surrey (including Croydon) is slightly under 2 per cent. of that of Great Britain and Ireland, and it has been assumed therefore that 55 may be taken as an approximate estimate of the epileptic pensioners in the former area.

The 726 cases of epilepsy included in the above table are equivalent to 0·75 per 1000 of the population of Surrey (including Croydon). If the 55 war pensioners, as estimated above, are added, the total of 781 is equivalent to 0·81 per 1000 of the population of that area.

Age and Mental Condition.

Table II. gives the age and mental condition of the 726 epileptics returned by the various authorities.

TABLE II.

Age-group.	Mentally normal.	Mentally deficient or feeble-minded.	Imbecile or idiot.	Insane.	Totals and percentage.
—* ..	3	—	—	—	3 (0·4)
0– 5 ..	9	3	5	—	17 (2·3)
6–10 ..	24	8	9	—	41 (5·6)
11–15 ..	44	20	21	—	85 (11·7)
16–20 ..	42	29	26	4	101 (13·9)
21–25 ..	21	8	18	12	59 (8·1)
26–30 ..	28	11	19	15	73 (10·1)
31–35 ..	13	12	20	24	69 (9·5)
36–40 ..	13	8	19	15	55 (7·6)
41–45 ..	15	8	7	13	43 (5·9)
46–50 ..	13	7	10	15	45 (6·2)
51–55 ..	10	3	4	16	33 (4·6)
56–60 ..	16	4	3	17	40 (5·5)
61–65 ..	3	4	4	8	19 (2·6)
66–70 ..	3	2	1	17	23 (3·2)
Over 70	8	3	3	6	20 (2·8)
Total ..	265 (36·5 %)	130 (17·9 %)	169 (23·3 %)	162 (22·3 %)	726

* Age not stated.

Of the 726 cases 515 (or 70·9 per cent.) are in institutions, the remaining 211 living at home. Fourteen cases are said to be blind as well as epileptic, 6 are dumb, 4 deaf, and 6 both deaf and dumb. Sixty-four cases are returned as crippled or paralysed, but these terms are so vague that the figure is of doubtful value.

It will be seen from Table I. that the number of male and female epileptics known to the various authorities is almost exactly equal. Sex seems to play no part in the incidence of the disease.

While youth and early middle life are most strongly represented, it is remarkable how the numbers of sufferers from epilepsy are maintained well into old age. If the generally accepted dictum be true that 80 per cent. of epileptics show manifestation of their disease before the age of 20, it would appear from this table that the expectation of life is greater than is supposed. Younger epileptics, of course, would have

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT CARDIFF.

(Continued from p. 525.)

SECTION OF DISEASES OF CHILDREN.

UNDER the presidency of Dr. ALFRED HOWELL (Cardiff) a discussion on

CHRONIC SPLENOMEGALY IN CHILDHOOD,

its Diagnosis and Treatment, was introduced by Dr. ROBERT HUTCHISON (London), who said that before proceeding to the differential diagnosis of the various splenomegalies of childhood it was advisable to make sure that the abdominal tumour in question really was an enlarged spleen. Usually this was easy enough, but sometimes there was a doubt, especially as to the possibility of the tumour being an enlarged left kidney or suprarenal. Having settled that the tumour was really an enlarged spleen it was necessary to have some sort of classification of the different varieties of splenomegaly met with in childhood. An ætiological classification was the only satisfactory one, but was impossible in the present state of our knowledge and, therefore, for purposes of discussion, he proposed to consider the subject under certain broad groups.

Tumours were very rare and for practical purposes undiagnosable.

Chronic Infections.—In tuberculosis splenomegaly was unlikely to be the "presenting sign." The relation of congenital syphilis to splenomegaly was very important, but he suggested for the purpose of discussion that its frequency as a factor in causing that condition was exaggerated. In pre-Wassermann days the tendency was to ascribe every splenomegaly of doubtful origin to syphilis. It had been suggested by Dr. Parkes Weber and others that an inherited taint might form a basis on which enlargement of the spleen—though not primarily due to syphilis—might develop more easily than in a normal child. Such a view appeared very speculative. In cases of syphilitic splenomegaly in which vigorous antisyphilitic treatment did not produce any diminution in the size of the spleen splenectomy was indicated. Lymphadenoma as a cause of enlargement of the spleen without any evidence of the disease in the glands was very rare, and he did not see how it could be diagnosed with certainty. Chronic sepsis had been put forward as a cause of splenomegaly as of most things. That splenomegaly might be the presenting sign in cases of very chronic infective endocarditis (endocarditis lenta) was certain, but he doubted if cases of that very chronic type were ever met with in childhood.

Tropical splenomegalies such as malaria and kala-azar presented no difference from the adult form.

Splenomegaly in Metabolic Disease.—The part played by rickets in causing enlargement of the spleen had been as much exaggerated as the rôle of syphilis. Severe rickets certainly led to some enlargement of the spleen, but in some cases the organ was not so much enlarged as pushed down by the deformity of the ribs.

Gaucher's disease was rare, although not so rare as usually believed. Opinions as to the value of splenectomy were divided. The operation could not be regarded as a cure because the disease affected the whole of the reticulo-endothelial system, but if the tumour was causing discomfort its removal appeared to be justified.

Splenomegaly in Diseases of the Blood.—This group included the leukæmias, splenic anæmia of infancy (von Jaksch's disease), acholuric jaundice, purpura, and erythræmia. Splenic anæmia of infancy used to be relatively common, but had become rare in recent years. In considering its treatment it must be remembered that the disease tended to spontaneous recovery given suitable hygienic measures, and he did not consider that splenectomy was ever called for. Acholuric jaundice was now recognised to be of not uncommon occurrence; its diagnosis could be established with certainty and splenectomy was the only effective method of treatment.

Splenomegaly associated with Cirrhosis of the Liver.—Excluding Banti's disease three forms could be distinguished. First, an idiopathic, non-alcoholic progressive cirrhosis (Parkes Weber) of unknown cause which resembled the ordinary portal cirrhosis of adults, ran a fairly rapid course, and often terminated in hæmatemesis. There was always some enlargement of the spleen, but in some cases this was the "presenting" sign, and such cases had been spoken of as cirrhosis with "splenic predominance." The diagnosis from Banti's disease was not easy, and some writers—J. H. Thursfield, for example—maintained that splenectomy was almost invariably fatal, but he was not at all sure that such a view was correct. Secondly, a syphilitic cirrhosis with splenomegaly was met with in later childhood and did not always give a positive Wassermann reaction. Splenectomy might be justified if antisyphilitic treatment failed. And thirdly, splenomegaly with biliary cirrhosis (Gilbert and Fournier), believed to be the form which Hanot's cirrhosis took in the child. He was very sceptical as to the occurrence of Hanot's cirrhosis at all, and still more sceptical as to its occurrence in childhood.

Splenomegaly the Result of Splenic Thrombosis.—Wallgren had drawn attention to thrombosis of the splenic vein as a cause of splenomegaly in childhood, and believed that it was commoner than supposed, but was usually confused with Banti's disease. The leading features of the syndrome were splenomegaly, anæmia with leucopenia, and slight ascites. Sooner or later hæmatemesis set in, and after a bleeding the volume of the spleen shrank and a temporary leucocytosis occurred. The liver in all the cases which came to autopsy was found to be normal. The prognosis of these cases was bad unless splenectomy was performed.

Splenic anæmia of adult type and *Banti's disease* were to some extent diagnostic rag-bags. Seeing that the splenic anæmia of adults was a very prolonged disease, the final stage of which was only reached after some years, it followed that the full syndrome was not likely to be met with whilst the patient was still a child, but in spite of this he thought the diagnosis in childhood of Banti's disease was sometimes justified. The difficulty was to distinguish this disease from cases of idiopathic cirrhosis "with splenic predominance," and this could only be done if the history showed that the spleen had been enlarged for some years before signs of cirrhosis supervened. It was sometimes asserted that the presence of leucopenia put a case in the category of splenic anæmia rather than of idiopathic cirrhosis, but with this statement he could not agree because in his view leucopenia tended to be a feature of most chronic splenomegalies. The treatment for splenic anæmia of the adult type was splenectomy, but it was a matter for discussion as to whether the operation was worth doing after cirrhosis had supervened.

With regard to treatment, debate, said Dr. Hutchison, must chiefly centre round the question of splenectomy. He agreed with Parsons that the cases suitable for operation were those which showed a negative Wassermann reaction, no enlargement of the lymph glands and no characteristic leucocytic picture, but in which there was some degree of anæmia, associated with (1) leucopenia, or (2) increased fragility of the red cells, or (3) hæmatemesis. There might, however, be differences of opinion as to the advisability of splenectomy in Gaucher's disease and in cases of cirrhosis of the liver whether of the idiopathic or Banti variety, even although these fell within the limits of the above criteria.

Discussion.

Mr. L. E. BARRINGTON-WARD (London) said that from the surgical standpoint enlargements of the spleen fell into two categories. In the one group removal of the spleen cured the disease or produced a definite amelioration of symptoms; in the other splenectomy offered some hope of improvement, but without any prospect of producing a real cure. In the first class could be placed acholuric jaundice and public authorities of England and Wales approximates, or *should* approximate, 25,000.

Salient Points.

1. The sex incidence in the series of cases is equal.
2. The proportion of the insane rises rapidly in later years.
3. Only 60 per cent. of the epileptics who come under the notice of public authorities can be dealt with under the Mental Deficiency or Lunacy Acts; the remainder are "mentally normal."
4. The mental deficiency authorities deal with less than one-fifth of the cases coming within the scope of the Mental Deficiency Acts, the remainder being divided equally between the mental hospitals and the poor-law authorities. There appears to be a need for considerably more residential accommodation for epileptics certified and certifiable under the Mental Deficiency Acts.
5. 24·5 per cent. of educable children are at no school or institution.
6. It would appear that there are something like 25,000 epileptics chargeable to public authorities in England and Wales. The problem is, therefore, a large one, and it is submitted that the points that have arisen in connexion with this survey merit careful consideration.

BUCHAREST.

(FROM OUR OWN CORRESPONDENT.)

The Educational Treatment of Neurasthenia.

AT a recent meeting of the Medical Society of Bucharest Dr. Ramniceanu expressed the opinion that cases of neurasthenia were rapidly increasing in number. He showed that a definite percentage of the symptoms of a neurasthenic were illusory or hallucinatory in character, and claimed that practically every phase had one symptom, complaint, apprehension, or fear, which predominated over all the others. This one predominating symptom he called the chief obsession, and stated that when this was overcome or removed either by education, by medicinal treatment, or by psycho-analysis, all lesser symptoms were either abated or were entirely relieved. He cited a number of cases of neurasthenia from his own practice, giving the chief obsession in each case, and the educational or other means used to remove it. Reference was made to the use of some modern drugs in these cases; in Dr. Ramniceanu's view the majority of patients were made worse by their administration. It was essential to get hold of the mentality of each patient and to treat the mind rather than the body.

Poisoning by Wood Alcohol.

Dr. Olteanu describes in the *Spitalul* the case of a man of 34 who presented himself at the Central Hospital suffering from acute total blindness. Investigation of the history showed that the loss of sight had come on during the second day after taking about 50 c.cm. of corn brandy, which subsequent analysis showed to contain some 15 per cent. of wood alcohol. Symptoms which had accompanied the development of the eye condition included nausea, vomiting, weakness, cold extremities, and sensations of chilliness. On ophthalmoscopic examination the optic nerves presented the picture of a neuro-retinitis of moderate intensity, and in the macular regions were disposed numerous yellowish shining spots similar to those described as occurring in choroiditis guttata. Good food, warm baths, and large doses of potassium iodide were prescribed; four months later one eye showed complete recovery of function, and the other eye presented moderate concentric contraction of the field, considerable diminution of central vision, and impairment of colour vision.

Typhoid Fever in Children.

The differences between typhoid fever in children and in adults were recently reviewed by Dr. M. Edelmann in a communication to the Oradea Medical Society. Many of the 180 cases discussed showed the relation between vomiting and hæmorrhage first observed by Butler in the United States, especially those in whom vomiting had started at the onset of the illness and had been repeated. The appearance of the stools in very young children was not so characteristic as in adults, though in older children pea-soup stools often occurred. A preliminary constipation was shown to have no evil significance. Rose spots occurred in 52 per cent. of all cases, and herpes in three cases, two of which had complications. The average duration of the fever was 18 days, a much shorter period than is customary in adults. The usual parallelism between the pulse and the temperature was not present in very young children. Leucopenia was mostly present and the Widal test was positive in nearly all cases where it was performed. Relapses were more frequent than in adults, especially in girls. The mortality in the series of cases was 7 per cent., and was twice as high in relapses as in original attacks.

The Improvement of School Hygiene.

A movement is on foot for a great extension of the present methods of medical school inspection. It is championed by Dr. A. M. Marinescu who suggests the establishment of national, State, and local boards of school hygiene under the direction of specially qualified medical officers. Most of the bad conditions now existing he ascribed to the ignorance of school boards, of parents, and the children themselves. The functions of a national board would be to provide plans for sanitary school buildings and school furnishings, to conduct civil service examinations for school physicians, and to publish leaflets of instruction from time to time. The State boards should have the power to choose proper sites for schools, to frame and enforce laws governing school hygiene, to close insanitary school buildings, to ensure the exclusion of degenerate or criminal children from State schools, and to keep records of the progress and development of school-children of the State. The local board should consist of business men and physicians, should keep records, and should keep in touch with the national and State boards from time to time. Under this scheme every child in each school would undergo a complete physical examination. The functions of the board would also include the distribution of literature bearing on hygiene and also the instruction of parents as to the needs of each child, based on its physical examination.

RADIUM AT THE LONDON HOSPITAL.—At the quarterly court of governors last week it was reported that in response to urgent representations from the medical and surgical staff, the purchase of 210 mg. of radium for the treatment of cancer had been authorised, in addition to the 121 mg. already possessed. This amount, with the containers, will cost £2854. Last year more than 800 cancer cases were treated as in-patients and very many more as out-patients. Disappointment was expressed at the result of the quinquennial appeal, which has, so far, produced only £95,000. Last year 10,271 patients were admitted from London boroughs, and about 6000 from other parts of the country, including the Channel Islands.

ST. THOMAS'S HOSPITAL.—In his annual report, the treasurer, Sir Arthur Stanley, states that the number of in-patients last year was 11,510, who stayed, on the average, 18 days at a cost per head of £11 11s. 9*d*. New out-patients numbered 92,325, of whom 57,047 were casualty patients. They made 580,356 attendances and cost a fraction under 12*s*. 2*d*. each. The income was £190,000, of which investments produced £69,000, and the expenditure £183,000. Referring to the suggested coöperation of the voluntary hospitals with the public authorities in providing a medical service adequate to the needs of the community, Sir Arthur Stanley expresses the hope that nothing may be done that will interfere in any way with the autonomy of the voluntary hospital "which has proved of such immense value in furthering improvement in general methods of treatment, in research, in nursing, and in social service."

from each other very widely and were best considered as separate diseases. These were: (*a*) chronic interstitial nephritis; (*b*) chronic parenchymatous nephritis, including nephrosis; and (*c*) chronic ascending pyelonephritis. It was true that the latter was not a primary disease of the kidney, but it impaired the renal function in the same way as chronic interstitial nephritis and so was likely to be mistaken for it. Chronic hæmorrhagic nephritis was not included because such cases were probably recurrent attacks of slight acute glomerular nephritis.

Chronic interstitial nephritis was at one time regarded as a great clinical rarity and Leonard Guthrie, in 1896, could only collect seven cases under the age of 14; since 1911, however, when Fletcher, Parsons, and Miller drew attention to the fact that the disease might result in peculiar bony changes and dwarfism, a great number of cases had been recognised. He believed that there were three clinical types of this condition in children. There were, however, certain symptoms common to them all. The symptoms might arise from infancy onwards, but usually advice was not sought for several years, and then a history of thirst, polyuria, anæmia, and arrested development could be obtained. On the other hand, an attack of uræmia might be the first warning of the condition. In well-established cases the patients were usually emaciated, with coarse, dry, and pigmented skins, and were liable to repeated attacks of uræmic vomiting and headaches. There was no mental defect. If dwarfism and bone changes were present they might be of an extreme degree. Bone changes were not likely to appear in those cases which ran a rapid course towards a terminal uræmia, but only in those which ran a long course and in which the renal function was much impaired. Polyuria was a prominent symptom. The amount of albumin was variable and often so slight as to be overlooked. Casts, leucocytes, and red cells were to be found in the urine. The blood pressure might be normal throughout, high throughout, or become so during the course of the disease. Renal retinitis might be absent throughout, even although the patient died in uræmia. Renal function tests demonstrated great loss of function in all cases of "renal dwarfism" and "renal rickets." It was on certain combinations of these symptoms and signs hat he proposed to divide cases of chronic interstitial ephritis into three types.

Type 1.—A primary renal type without history of acute ephritis, or preceding sepsis. The chief features of this pe were that the onset of the disease was unrecognisable, at it had a slow course, and that renal dwarfism developed. ere was marked azotæmic nephritis, the blood pressure ally remained normal, and retinitis was not present. acks of tetany might occur, and the terminal uræmia that described as true azotæmic nephritis, an undramatic picture of muscular twitchings, vomiting, and coma.

Type 2.—A primary renal type with a history of acute glomerular nephritis, or prolonged sepsis. In these cases within a few years of the initial illness there was found a high blood pressure (150 to 200 mm.), cardiac hypertrophy, albuminuria, with numbers of red cells in the urine, azotæmia, and retinitis. The course of the disease in these cases was usually a rapid one.

Type 3.—A primary arterio-sclerotic type with secondary contraction of the kidneys. Cases in this group showed a preliminary stage of high blood pressure which was often found to be over 200 mm. when the patient was first seen. The blood urea was, however, normal and there was only a mere trace of albumin in the urine. Later there was cardiac hypertrophy, retinitis, and a tendency to "uræmia of the cerebral type," with transient amaurosis, monoplegia, and convulsions. Later still albuminuria and some azotæmia developed, and death occurred from heart failure or apoplexy.

Renal rickets and tetany in chronic nephritis were the result of a metabolic disturbance which accompanied azotæmic nephritis, but which did not yield to the usual antirachitic remedies; indeed, one of his cases was thrown into uræmia after exposure to ultra-violet ray treatment. Frank tetany was not common, but in many cases latent tetany could be demonstrated by the presence of Chvostek's sign. In azotæmic nephritis there was a retention of phosphorus and often a fall in the calcium of the blood, but in some cases of renal rickets the fall in blood calcium did not occur. It was reasonable to believe that the bony changes and the tetany which might be present were dependent on the disturbance of the phosphorus-calcium ratio of the blood and tissue fluids.

Chronic parenchymatous nephritis or nephrosis was the commonest form of chronic nephritis. Müller coined the term "nephrosis" in 1905, maintaining that the kidney lesion was a degeneration and not an inflammation. Now it appeared that the disease was not primarily a kidney disease at all, but a general disease with "an abnormal permeability of the cutaneous and renal vessels for albumins and lipoids referable to changes of metabolism," so the most recent fashion was to call it "lipoid dystrophy of the kidneys." The only evidence that the clinical condition was due to a disease of the kidneys was the occurrence of albuminuria and casts in the urine, but there were cases on record in which the œdema preceded the urinary findings. Some held that the œdema was due to the retention of chloride, but de Wesselow had shown that the kidneys were quite capable of passing and concentrating the chlorides if they were given the opportunity. These cases rarely ran an uncomplicated course and were peculiarly liable to secondary infections, and at such times a glomerulitis with hæmaturia and nitrogen retention were superimposed. With regard to treatment, Marriott maintained that the disease was due to a toxin which damaged the tissue cells, causing them to absorb more chloride from the blood, so producing œdema. The toxin was usually the result of a staphylococcal infection of the mastoid or paranasal sinuses, and therefore this writer advised a very thorough examination and exploration of these sites and reported rapid cures after sinus drainage. Osman had revived the using of large doses of alkalis as a method of treatment, and this should be tried in obstinate cases, but it should be remembered that it often produced severe vomiting and tetany. The disease was so liable to fluctuations that it was difficult to assess the value of any particular form of treatment, but it was commonly agreed that a high protein diet was beneficial, that decapsulation of the kidney was useless, and that it was imperative that every patient with nephrosis should be guarded rigidly against the development of intercurrent infections in case an acute hæmorrhagic nephritis developed.

Chronic Ascending Pyelonephritis.—Most cases of acute pyelitis, if promptly diagnosed and treated, made a satisfactory recovery, but there were more chronic cases which remained in ill-health and were liable to recurrences of fever and pyuria. In a few of the latter a permanent damage of the kidney resulted and the failure in renal function showed itself as an advancing azotæmic nephritis ending in uræmia. If the condition was sufficiently prolonged these patients developed renal dwarfism. In such instances the question as to whether there was some chronic obstruction or deformity of the urinary tract which was the cause of the infection must be considered. One of the most striking examples of ascending pyelonephritis was due to a valvular obstruction in the posterior urethra of male children, of which quite a considerable number of cases had now been diagnosed and successfully treated.

Discussion.

Dr. NORMAN B. CAPON (Liverpool) said he wished to lay down two propositions. First, that in any particular case of nephritis the lesions were diffuse; and, secondly, that the renal efficiency tests were not of very great assistance and were of little real value in treatment. Every case of chronic nephritis represented a kidney which was the seat of repeated acute attacks. Emerson had pointed out that chronic nephritis was not the result of one, but of a thousand and one acute attacks. The treatment of chronic nephritis in general was a dismal thing, but in the treatment of chronic hæmorrhagic nephritis—the commonest form of nephritis—there was a little more ground for hope. Effective treatment of tonsils, teeth, or any other infective focus did more to allay-thrombo-cytopenic purpura. The second class was made up of more debatable material, but he advocated early splenectomy in Banti's disease before ascites developed. In Gaucher's disease if the spleen were large and producing abdominal discomfort he thought removal should be practised. Splenomegaly due to thrombosis of the splenic vein was difficult to diagnose and could only be recognised with certainty at operation or autopsy. The difficulties of splenectomy in this condition were very great. With regard to the operation of splenectomy blood transfusion was essential both before and after operation. He had not had any experience of preliminary irradiation of the spleen in children, but this procedure had been well spoken of in leukæmia by W. S. Mayo. Gas and oxygen was the anæsthetic of choice. Happily the common conditions, for which removal of the spleen was required in children, presented no great difficulties.

Prof. **Leonard Findlay** (Glasgow) pointed out that it was only possible to estimate the palpability and not the size of the spleen, because conditions such as hypernephroma, retroperitoneal sarcoma, enlargement of the liver, or a deformed chest would displace an enlarged spleen. He agreed with the opener that there was not any enlargement of the spleen in rickets unless that disease was complicated by tuberculosis, syphilis, or severe thoracic deformity. He had on one occasion found a palpable spleen as the only evidence of tuberculosis, but the diagnosis was only made as the result of splenic puncture, and he had also seen a case of lymphadenoma in which, except for anæmia, splenomegaly was the only manifestation of the disease, the diagnosis being made at autopsy. Whilst he agreed that the incidence of congenital syphilis had been overestimated yet in the presence of anæmia and splenomegaly that disease must be eliminated by a negative Wassermann reaction. Splenectomy did not interfere with the course of von Jaksch's anæmia, but after splenectomy in that disease the number of leucocytes diminished whereas they increased after splenectomy for other conditions. Of the two cases quoted by Dr. Hutchison as examples of cirrhosis of the liver with splenic predominance and Banti's disease respectively, he thought that either case might do for either condition. There was a great deal of confusion about Banti's disease, but Banti himself had stated specifically that cirrhosis of the liver was present in the early stages of the disease; there should, however, be no confusion as to the methods of arriving at the diagnosis of the cause of an enlarged spleen, which were: a complete blood count, an estimation of the fragility of the red cells, a Wassermann reaction, and splenic puncture. Without splenic puncture it was impossible to separate Banti's from Gaucher's or Hodgkin's disease, tuberculosis, &c.

Dr. C. P. **Lapage** (Manchester) in his remarks dealt chiefly with cases of Jaksch's anæmia which had been under his care. The frequency of this disease, which occurred chiefly in the artisan classes, had diminished considerably but was now increasing again. Two cases had occurred in one child of each of two pairs of twins. Many had suffered from digestive disorders and many showed signs of rickets. He did not consider the latter a causal factor nor was there anything to suggest that the disease was due to syphilis. The blood showed a secondary anæmia which varied from time to time. He had been able to follow up some of his cases and all of those examined were in ordinary health, the blood and spleen being normal. He hesitated to recommend splenectomy and thought that in all cases arsenic, benzene, and, perhaps, liver extract should be tried first, but if the child was not very ill and the course of the disease a protracted one, splenectomy was advisable.

Dr. J. **Wilkie Scott** (Nottingham) said that in cases with splenomegaly and hæmatemesis he found it difficult to differentiate splenic thrombosis from cirrhosis of the liver. He had recently seen two patients who when apparently healthy had an acute hæmatemesis followed by a rise of temperature and slight ascites. In both instances splenectomy was performed with successful results. Thrombosis of the splenic vein was not found at operation, and he thought the hæmatemesis was due to an active and not a passive hyperæmia, possibly caused by a perisplenitis.

Dr. **Hilda Stoessiger** (London) described a case of Banti's disease occurring in a boy aged 14. The patient had suffered from abdominal discomfort due to the presence of an enlarged spleen for some months; there was slight anæmia with leucopenia and the Wassermann reaction was negative. A lævulose tolerance test showed marked hepatic insufficiency. Splenectomy was performed and at operation the liver was noted to be cirrhosed. Two years later the patient was well, but the onset of puberty was delayed. The liver was enlarged and still showed marked inefficiency.

Dr. **Leonard G. Parsons** (Birmingham) agreed that the diagnosis of an enlarged spleen might be difficult and quoted a case in which a mass of tuberculous glands presented under the left costal margin and showed typical splenic notches. He had listened with great interest to Dr. Hutchison's remarks on the differentiation of Banti's diseases from cirrhosis of the liver with splenic predominance, and he agreed with Prof. Findlay's criticism of the cases quoted. As far as he (Dr. Parsons) could judge the only point of difference between the two conditions was that the cases of "splenic predominance" ran a more rapid course than those of Banti's disease. Splenomegaly with thrombosis of the splenic vein described by Walgren was not mentioned as a cause of enlarged spleen in the discussion on this subject at the Royal Society of Medicine in 1925, but two of the cases described by him (the speaker) as instances of Banti's disease had been claimed as examples of the Walgren type. He asked whether Mr. Barrington-Ward recommended the removal of spleniculi if found during the operation of splenectomy in acholuric jaundice and if the gall-bladder should be examined for gall-stones, as recommended by Sir Berkeley Moynihan.

Dr. E. A. **Cockayne** (London) pointed out that although removal of the spleen for acholuric jaundice cured the symptoms, yet it did not cure the disease. He asked if irradiation of the spleen had any curative effect on this disease, and also if this method of treatment produced adhesions and thereby rendered any subsequent operation more dangerous. Splenic anæmia of the adult type, if diagnosed, should be treated by removal of the spleen because it was a primary splenic disease, but there was no method of accurately diagnosing the condition. Some cases of cirrhosis of the liver ran a very protracted course and this, he thought, accounted for some of the supposed cures of hepatic cirrhosis after splenectomy. Since hepatic cirrhosis was a primary liver disease a cure could not be expected by performing splenectomy.

The **President** said that occasionally patients suffering from acholuric jaundice showed a normal red-cell fragility. He also referred to the occurrence of pigmentary concretions in the gall-bladder in this disease, pointing out that Mayo had found these in three out of five cases.

Reply.

Dr. **Hutchison** said he quite realised the difficulty in deciding into which category a case should be put, but if the splenic enlargement had been known to be present for some years before cirrhosis of the liver developed the case should not be classed as one of idiopathic cirrhosis.

CHRONIC NEPHRITIS IN CHILDHOOD.

The subject was opened by Dr. J. C. **Spence** (Newcastle-on-Tyne), who said that from the standpoint of morbid anatomy there were no forms of chronic nephritis which were peculiar to childhood, but there were certain clinical features about the disease in children which deserved attention and which might throw some light on some of the obscure problems of the subject. For the purposes of description and discussion it was necessary to attempt some form of classification. Three main groups of the condition occurred in childhood, and these differed to the action on the disease directly, but to an action on the skin, and only indirectly on the disease. In the various lamps employed for the artificial production of ultra-violet rays the spectral distribution varies greatly. Sunlight at sea-level contains less than 2 per cent. ultra-violet rays, but in a water-cooled mercury-vapour lamp the ultra-violet rays may rise to 50 per cent., and the spectral quality is different from that of the sun in that it contains a large proportion of the short and more physiologically active waves, so that with such an artificial source the skin is subjected to rays of a quality foreign to natural sunshine. In his opinion the carbon arc was the nearest approach to the natural sun. Sunlight, ultra-violet rays, and infra-red rays all cause the skin to turn red at first, and if the dose is repeated or prolonged to become pigmented later. Pigmentation rom lamps is more superficial and transient than that roduced by sunshine. Apart from its action on the in, ultra-violet radiation gives a feeling of well- ing and vigour. Many other effects on metabolism re been ascribed to ultra-violet rays, but he did believe they were specific. The skins of patients r in their reactions towards light, due probably he presence of a sensitiser. But quite apart from this natural sensitiveness the condition can be acquired. The application of powerful ultra-violet rays alter the proteins of the skin. These abnormal proteins are absorbed, and an allergic condition arises in which the skin becomes intolerant to light. Thus, the importance of correct dosage cannot be overexaggerated, since burns may lead to light allergy. Much of the literature in the advertisements on lamps leaves the impression that they are a panacea for all disease. In reality, very many patients are not benefited by this treatment, and some may suffer injury. The radiations from ultra-violet lamps, which emit rays of shorter wave-length than those found in the solar spectrum, when applied to the skin, are just as foreign to the body as to be comparable with the administration of a poisonous drug; either may be beneficial in a suitable subject but iarmful in an unsuitable. Few of us would dare to ave a prescription containing poisons dispensed y an untrained person, but the dispensers of rays are uncontrolled, unregistered, and may be unqualified. At the present time all kinds of rays are used by charlatans in Europe and America to impose on the public. Sun ray institutes are becoming the fashion, and the public is buying machines and indulging in self-treatment. Already action has been taken in France and America, and an endeavour is being made to control this form of treatment and prevent its indiscriminate use, and he thought it was obviously right that the public in this country should be given such information as will enable them to distinguish etween those who have been properly educated to ispense rays, and others.

"I have endeavoured," said Prof. Dixon, "to show that treatment by radiation may be either beneficial or harmful; that its employment by unskilled people may cause serious ill-effects to the patient, and that the time has come when some sort of protection must be extended to the public."

Dr. C. B. HEALD (London) said there was ample evidence that electrical treatments could do harm; and he commended the resolution passed by the Representative Body a few days previously.[1] He instanced cases where fatalities had occurred with much lower voltages than those in general therapeutic use. With regard to the ignorant applications of X rays and radium, it was not necessary for him to dwell on the dangers both to patient and operator. But he pointed out that special courses and diplomas in radiology and electrotherapeutics for medical men had been instituted, and the possession of such a diploma was essential in many hospitals for the appointment of radiologist. Coming to ultra-violet light, he said an argument sometimes advanced is: "Control X rays, radium, and obviously dangerous things like that if you like, but surely no one can do much harm with an ultra-violet lamp. At the worst, all that can happen is an uncomfortable sunburn." That idea he most strongly condemned. Prof. Dixon had shown the dangers of ultra-violet radiation, and public interest demanded imperatively that it should only be used by trained and experienced persons. He had examined the evidence of damage by ultra-violet light treatment from the contributions of many writers. He mentioned three of the ailments that had been adversely affected—quiescent phthisis, arterio-sclerosis, and chronic nephritis—and asked how the unqualified therapist was to recognise these conditions. Many of the contra-indications to ultra-violet treatment are such that the qualified doctor finds it hard to detect their presence, and there was certainly not the least hope of the unqualified detecting them before damage was done. He thought the formation of a roll or register of persons regarded by a competent authority as suitably qualified to administer medical electricity as a matter of urgency. It would enable those of the public who cared for their own safety to be sure of their therapist. It would also be of great value to doctors who would thus be able to select a suitable assistant to whom to send their cases. The duly qualified among the medical electricians would welcome it, if for no other reason than that it would protect them from the unfair competition, backed by advertisement, of those who have spent neither time nor money in acquiring skill and experience and who are not bound by any ethical rule of modesty or truthfulness.

Discussion.

Dr. OWEN L. RHYS (Cardiff), who presided, thought the most striking point brought out by the introducers was that here was an agent with potentialities of danger still largely unknown.

Dr. A. J. H. ILES (Taunton) said that a penal clause regarding unqualified practice should certainly be imposed and that it should be also made illegal for a registered electrotherapeutist to employ people who themselves were not qualified. It should also be made clear that if a medical practitioner sent his cases to an unqualified electrotherapeutist he would be responsible if any damage resulted.

Dr. MARIA ARMSTRONG (Ballymena) asked how far responsibility rested with the prescribing physician. In a cottage hospital with which she was connected, "artificial sunlight" lamps had been instituted, and the committee had thought that the treatment might be in the hands of the masseuse, who, by her own admission, knew nothing about light treatment and was not even qualified in electricity. The doctors, however, had refused to allow the treatment to be placed in the hands of this woman, or to be responsible for mistakes made by her.

Dr. P. W. HAMOND (Croydon) said that this matter had been discussed in the Representative Meeting, and the conclusion arrived at was that no absolute rule could be laid down, and that if legal proceedings resulted, each case would have to be decided according to the circumstances.

Dr. GARFIELD EVANS (Cardiff) considered that there should be a definite course of training undertaken by the people who were going to administer light treatment, and that a register should be set up.

Dr. T. MARLIN (London) said that he had refused to instal a mercury-vapour lamp (although it was very convenient for treatment) because he felt that this was an agent of which so little was known.

In reply to a question as to whether the proposed registrants would be required to be medical men or qualified physicists, Dr. HEALD said that, in his view, a registrant should be required to produce some evidence of qualification such as the B.Sc. in physics, and should undertake that he would not act except under medical guidance as to treatment.

Prof. DIXON agreed with Dr. Heald. It was the function of the physician, he said, to diagnose and then to prescribe treatment, but in a number of cases the treatment required was of a very special kind.

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[1] See THE LANCET, July 28th, p. 194.

the course of the disease and limit the number of recurrences than any other method.

Dr. COCKAYNE, who was in the chair, stressed the importance of discussing treatment because if, for instance, nephrosis was due to infection it obviously could be effectively treated.

Dr. PARSONS pointed out that in one type of renal rickets—the "stippled" type—primary optic atrophy was not uncommon and was probably the result of pinching of the optic nerve in the foramen. With regard to the suggestion that the parathyroids might be connected with the bone changes and the absence of tetany, the Section might be interested to know that he had given parathyroid hormone for some time to a child suffering from "renal rickets" with the result that her blood calcium was raised to a higher level, and in the radiogram the rickets appeared to be increased. Owing to the normal variations of the disease, however, it was not possible to say whether this was cause and effect. It was, however, clear that the hormone should not be used in the treatment of tetany in renal rickets, and it was also important to avoid making use of acid sodium phosphate because this drug was likely to produce an attack of tetany in these children.

Dr. HUTCHISON said that Dr. Spence was particularly well fitted to open the discussion because he was a biochemist as well as a physician. The difficulty in discussing the subject was the question of classification because the more chronic was the case the more likely were the lesions to be diffuse. He wondered whether the primary renal type was a true renal disease. Might not the renal changes and the rickets be both manifestations of a metabolic disorder? He had never seen the primary arterio-sclerotic type in a child, and he doubted whether the condition was, as generally stated, a primary vascular disease with secondary renal changes, and he suggested that the glomeruli at least were affected. He noticed that the opener had not said much about casts in the urine, and he asked if any importance was to be attached to these because he himself thought that granular and blood casts were of great importance. He did not believe that staphylococcal infections were the cause of chronic parenchymatous nephritis, nor had he ever known decapsulation of the kidneys do any good. Quite dramatic results, however, sometimes occurred in that disorder as a result of tapping if the œdema was very marked. In many cases after treatment by dieting and diuretics had failed, tapping not only removed the fluid but a spontaneous diuresis had occurred and the dropsy did not return.

Dr. WILKIE SCOTT said he had recently had two cases of the arterio-sclerotic type which threw some light on the cause of that condition. Both cases had retinal changes and normal blood urea, and both at the onset had hæmaturia, a fact which suggested that this type was the result of an acute, perhaps slight, hæmorrhagic nephritis. He had been impressed with the number of times a slight hæmaturia was found in patients who were in hospital for nasal disorders, and which was only discovered by routine examination. He also quoted another case in which there was marked œdema and ascites but no albuminuria until within a day or two of the child's death, and at the autopsy the kidney showed the lesion of a typical chronic parenchymatous nephritis.

Dr. LAPAGE was convinced of the septic origin of many cases of chronic nephritis, and that not enough attention was paid to dieting. Many cases were kept on too low a diet, thereby preventing recovery.

Dr. D. T. DAVIES (Cardiff) agreed that the study of uræmia in childhood was one that promised to be of great value. In the primary renal type there was a conspicuous absence of respiratory symptoms, and also for long periods of time the blood urea was high, even as high as 300 mg. per cent., without any symptoms of uræmia. When uræmia occurred vomiting was a marked symptom, and this was one method of excreting urea, for he had found as much as 600 to 800 mg. per cent. in the vomitus. Another point to remember was that osseous changes were not invariably present.

Dr. A. MONCRIEFF (London) said that there were two ætiological factors in chronic nephritis—the vascular and the infective. The vascular factor had been emphasised by Volhard, who said that the glomerular vessels were affected in exactly the same way as the vessels of the skin by chill. The vessels contracted, nutrition was cut off, and death and degeneration followed by fibrosis occurred. Infection caused kidney damage in one of two ways: streptococcal emboli might affect the glomeruli producing acute hæmorrhagic nephritis, or toxins might affect the tubules and produce a chronic parenchymatous nephritis. The vascular cases were difficult to treat, but it might be possible to do something for the infective ones. It should be remembered that in lipoid nephrosis the kidney was choked with fat, which interfered with filtration just as filter paper when soaked in fat delayed filtration; therefore it was essential to give a low fat diet in the treatment of this disease.

Dr. HOWELL quoted a case of the primary renal type which had recently been under his care and which had died from uræmia. This case was sent up to the orthopædic department for treatment of knock-knee and showed other evidence of renal rickets. The optic discs in this case were pale, although he could not say that there was any actual atrophy.

Dr. H. GAINSBOROUGH (London) said he disliked the term "lipoid nephrosis" because he did not know what a "lipoid" was. Nor did he see any reason for giving a fat-free diet in cases of this disorder, because cholesterol was not a fat.

SECTION OF RADIOLOGY AND PHYSIO-THERAPEUTICS.

ULTRA-VIOLET LIGHT AND THE GENERAL PUBLIC.

Prof. W. E. DIXON (Cambridge) outlined the nature of radiation and said the different rays so far as they have been mapped extended through 62 octaves. Visible sun rays occupy only one octave. Beyond the violet rays of visible light are five octaves of ultra-violet rays which are invisible. Solar radiation contains a few of these, something less than one octave. On the other side of the solar spectrum are the infra-red rays, about seven octaves, of which solar radiation contains three or four. Sun rays have been used in the treatment of disease for long ages, but during the last 30 years precise observations have been made of their action in disease. The proof is complete that they exert a curative action in cases of surgical tuberculosis, rickets, and in some cases of nerve disease, anæmia, and skin disease, but atmospheric conditions alter the action of sunshine to some extent. Thus, the presence of water vapour acts in much the same way as a fire screen which lets us see the fire but cuts out the heat.

It is generally believed, said Prof. Dixon, that it is the violet and longer ultra-violet rays that possess the greatest curative value, because these are especially prevalent in the sunshine of mountainous districts and near the sea where they become refracted and reflected by the sand and water. If the short ultra-violet rays were the most important, then the mercury-vapour lamp, in which they are very rich, ought to be the most effective treatment. Rollier, the pioneer of sunshine treatment, regards the light waves as the most important, and abundant pigmentation as a sign that the patient is deriving benefit. Others believe that the value of heliotherapy is the direct effect of the power of the rays to produce redness of the skin. All skin contains a substance called ergosterol; when this is acted on by ultra-violet rays it is changed chemically and the changed substance acts as a preventive and a cure for rickets. So that in this particular instance ultra-violet is all-important. Regarding general benefit, however, all we know for certain is that sunshine exerts a curative action in certain diseases, and that this is not due

After several questions Dr. **Barber**, in reply, pointed out that they had not claimed to have discovered the cause of urticaria, but had simply investigated the biochemistry of the allergic state. The causation was a much more complicated matter. Allergic symptoms were common in liver disease—prurigo and itching, for example. One of the functions of these allergic people was wrong, either from heredity or some other cause. Amino-acid estimations had been done in a very long list of other diseases. There was an initial acidosis in allergic states, and bicarbonate of soda might stop this. The calcium factor entered in relation to the vegetative nervous system; the irritability of the sympathetic largely depended on the calcium content. Protein therapy acted by desensitisation and preventing anaphylaxis. The liver was in some way responsible for anaphylactic shock, which could not be produced if the liver were cut out. He had used ephedrine and atropine, which undoubtedly acted through the parasympathetic system, on which the symptoms depended. Adrenalin acted on one phase only of the anaphylactic state. He thought it unjustifiable at present to speak of treatment.

Dr. **Hallam**, in reply, expressed sympathy with speakers who had asked for guidance in treatment, but said there was no other way than to go systematically through the possible causes. He had been disappointed in autohæmotherapy. Cases varied very much and often got well by themselves; he agreed that many were due to a *B. coli* leak through pelvic adhesions.

THE STEAM CAUTERY IN DERMATOLOGY.

This, said Dr. **Semon**, was a most valuable destructive agent, especially when associated with vigorous use of the sharp spoon. It was better than diathermy, because there was no fear of breakdown of the apparatus, which was portable, cheap, and independent of lighting circuits. The penetration of heat was very slow, about an inch a minute, and it was therefore possible to determine when normal tissue had been reached and save penetration of cartilage or mucous membrane. Open ether should be avoided because of the open flame, and local anæsthesia was the best. The only hitch he had encountered was locking by chalk deposits from the water; either istilled water should be used or the pipes should be leared periodically with a piece of wire. There was ever any charring, and a constant heat was well aintained and bleeding easily controlled, provided e apparatus was cleaned from time to time of the altered blood that crusted on to it. A striking feature was the absence of consecutive pain. The steam cautery was indicated for any accessible epithelioma, especially where cartilage and mucous surfaces were involved and X rays and radium therefore futile. It was useful for lupus verrucosus if the horny layer were previously macerated with salicylic acid plasters for a few days. The tuberculous nodule was blackened by the cautery and stood out against the white scar tissue. Soft chancres and chancroids were very amenable, and the steam cautery would probably prove the method of choice for them. Granuloma pyogenicum and intractable papillomatous leukoplakia of the tongue had been cured (THE LANCET, Oct. 8th, 1927). The tissue to be destroyed must be soft and free from horn, so that warts and unmacerated verrucose tumours were excluded. The coagulability of the tissue was important, therefore moles and fibromata were not amenable, but anthrax pustule and Delhi sore probably would be. The wound must be kept dry until the slough separated; ambrine was good for the raw stage and red lotion or scarlet red might be applied if the granulation were poor. There had been very few complications.

Dr. J. E. M. **Wigley** (London) suggested that electrical heating of the water would be more convenient, and mentioned the danger of local treatment of carcinomata, with which infected glands were so often associated.

Dr. **Semon**, in reply, pointed out the value of being independent of electrical circuits and agreed that only local growths should be treated locally. The steam cautery was better than the knife in that it closed channels rather than opening them.

THALLIUM DEPILATION FOR RINGWORM.

Dr. **Wigley** recorded the treatment of 50 outpatient cases of both sexes, aged between 18 months and 9 years. Depilation had been spontaneous only in 50 per cent., and growth had been much more rapid than after X rays. On checking the cures by Wood's glass inspection he had found that many macroscopically normal hairs showed fluorescence, and the microscope revealed infection along their length. Hairs infected with endothrix but with unbroken cuticle failed sometimes to fluoresce. X rays might fail but the failures were not deceptive, whereas those of thallium were. Moreover, it was impossible with out-patients to be certain of the vigorous local treatment essential during the depilation stage of thallium treatment. The older the child the more certain were the toxic symptoms. Physicians should be very chary of risking permanent damage to the growing organism for a treatment that was by no means a certain cure. There was great risk of reinfection of the growing hair, and he preferred X rays from every point of view.

Dr. **Barber** agreed that thallium was very dangerous for older children though useful for young ones, who were unsuitable for X rays.

Dr. **Haldin Davis** (London) doubted whether there remained any field for thallium; everyone agreed that it was dangerous to a child over 6, and younger children could be treated by X rays if given a 20-gr. dose of bromide the night before, the morning before, and half an hour before treatment. This was better for them than the "psychic trauma" of forcible restraint.

Dr. **Semon** did not agree. The results of bad X ray treatment were appalling, and he had never heard of a fatal case of thallium poisoning. Toxic phenomena were probably due to keeping the hygroscopic acetate too long.

Dr. **O'Donovan** had abandoned thallium. The occasional catastrophes were no more reason for abolishing X rays than anæsthetic deaths were for abolishing chloroform.

Dr. **Hallam** agreed with Dr. Semon, but thought both methods were bad. He had had 13 failures out of 42 out-patients treated with thallium, and seven had had severe toxic symptoms. Patients did much better if kept in bed throughout the treatment. The dosage ought always to be checked by a third person.

Dr. J. T. **Ingram** (London) had had only three failures in 48 cases treated with thallium and would continue to use the drug for selected cases. Only one child had had toxic symptoms, and she had been over 8 years of age. It was important to have the patient under careful supervision during the period of depilation.

The **Chairman** agreed that neither method was satisfactory, but still kept an open mind for thallium.

ILL-EFFECTS OF SALVARSAN.

Dr. **O'Donovan** said that there were no clear and recognised ill-effects of salvarsan therapy; ill-effects might follow small doses of any brand and might appear at any time. Alarming lists of untoward symptoms had been recorded, including headache, shivering, vomiting, dyspnœa, palpitation, fainting, cramps, diarrhœa, cardiac distress, jaundice, urticaria, and many other dermal reactions, Reynaud's syndrome, uterine hæmorrhage, epileptiform seizures, epistaxis, and hæmaturia. Many cases were lost sight of through dissociation of clinics from general hospitals and practitioners. Dr. O'Donovan then gave details of a case of post-salvarsan melanodermia, another of maculo-melanodermia with follicular hyperkeratosis in a French polisher, and a third of multiple subcutaneous abscesses associated with arsenical exfoliawhich the physician himself might not have the time, or perhaps the skill, to carry out. The physician did not make up prescriptions; they were made up by skilled people called chemists. If a medical man decided on ultra-violet light treatment he should put down on the prescription the light source, the area to be irradiated, the time, and so forth, and the administration of the treatment should be carried out by people trained in a particular way; that they should not be unskilled people was perfectly obvious.

SECTION OF DERMATOLOGY.

UNDER the presidency of Sir ROBERT BOLAM a discussion on

URTICARIA

was opened by Dr. R. HALLAM, who said that this complaint was both common and distressing. It served to impress on the dermatologist the fact that a change in the skin was often the expression of some pathological process in another part of the body, and that a knowledge of the latest advances in biology and physiology were necessary for its elucidation and treatment. Urticaria was not a disease but a symptom. Urticaria factitia or dermographism might or might not be accompanied by urticaria vulgaris but, curiously, did not irritate. Lewis had ascribed the wheals of both to the release of a histamine-like substance from the cells of the skin, though the cause of the exaggerated susceptibility of the patient with urticaria factitia was not clear. Its incidence was higher in epileptics and alcoholics, although it occurred in perfect health. Acute urticaria might follow some dietetic error and be accompanied by more or less severe constitutional symptoms. The chronic recurring form, however, was that which most exercised the skill and patience of the physician. True urticaria was not common in children, but papular urticaria, or lichen urticatus, was usually classified with it and was peculiar to childhood. A curious feature was that patients recovered directly they were admitted to hospital, even without treatment, and their rash recurred on discharge. Anaphylaxis did not always explain the reaction, and the term "sensitisation" had therefore to be used for the inexplicable predisposition to react to stimuli which had no effect on a normal individual. The antigen might be ingested, inhaled, or absorbed through the skin with identical results. The susceptibility apparently existed in the serum and was transmissible to offspring. When once sensitivity to one antigen was established, sensitiveness to others seemed to follow. The diversity of the causes of urticaria had long been recognised; Dr. Hallam thought that focal sepsis played a far greater rôle than food protein. Every case must be approached with the greatest circumspection and each system must be examined. Trauma might be an exciting cause. Should the offending antigen be detected, desensitisation might be attempted. Of empirical remedies, calcium salts were disappointing. If the exciting cause could not be discovered, thyroid extract was worth a trial.

Biochemical Investigation.

Dr. H. W. BARBER (London) discussed the biochemical investigations of Mr. G. H. Oriel and himself into allergy, which he characterised as the most important biological and medical problem that had ever existed. It represented the pathology of the reaction of man and the lower animals to their environment. It seemed clear that in the ichthyosis-asthma-hay-fever-eczema-prurigo-urticaria-migraine syndrome, in which there was almost invariably a strong family history, there must be some inborn metabolic kink predisposing the victim to become sensitised to various proteins. Dr. Oriel had discovered an "ether reaction" in the urine of certain cases of cardiac failure and also in urticarial subjects. The connexion between the two was probably some degree of hepatic insufficiency or some common factor concerned with the production of tissue œdema. The reaction was also positive in other allergic patients and in toxic jaundice; this supported the hepatic theory of its cause. The amino-acid content of the blood had therefore been estimated, and found to be high in untreated allergic patients, especially during attacks, but to return to normal when the condition remitted or was cured. Only a small number of estimations of urea, uric acid, and creatinine had been made, but these non-protein nitrogenous substances seemed also to be raised during the acute paroxysms. The rise in amino-acid might be partly accounted for by the presence of toxic amines of the histamine type, or might be merely an indication of the disturbance of endogenous protein metabolism. All allergic attacks were accompanied by almost complete suppression of chloride excretion, which became excessive immediately after recovery. The total blood chlorides were markedly diminished, whereas the serum chlorides might remain normal—i.e., there was a reduction in the corpuscle content of chloride. In simple urticaria the chloride reduction occurred during the attacks and was apt to return to normal in the intervals. Deposition of urates often occurred. This was not related to concentration or acidity but to the state of the urine colloids, and was always an indication (except after excessive sweating) of a temporary functional metabolic disturbance. To summarise the findings in the blood: just before and during the paroxysms there was a rise in amino-acid content, in uric acid, and creatinine, and a fall in total chloride—chiefly that of the corpuscles. In the urine there was a rise in free acidity; in ammonia excretion (the ratio of free acid to ammonia was altered); in specific gravity, owing to diminished water excretion; in excretion of amino-acid, creatinine, and uric acid. There was a retention of chlorides; urates often deposited on cooling; and ether reaction was strongly positive. After the subsidence of the paroxysm all these were reversed, diuresis occurred, and the urine often became alkaline.

Very large numbers of controls and of patients with all varieties of allergic disease had been tested and the results had been remarkably constant. It was probable that the increased ammonia excretion and the reaction of chlorides were protective mechanisms. These investigations suggested certain principles of treatment based on the idea that the central factor in allergy was hepatic insufficiency. These principles had proved successful clinically, and were of far wider application than at first appeared; it would enable us to prevent light sensitisation and the after-effects of treatment by deep X rays, arsenic, bismuth and gold, as well as the more strictly allergic conditions.

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Dr. H. C. SEMON (London) asked why allergic phenomena did not occur more often in cases of undoubted hepatic insufficiency, and in what other diseases the investigations had been made. Certain cases of urticaria reacted very well to calcium injected intravenously; others to autohæmotherapy and protein shock, which was rather difficult to explain on Dr. Barber's hypothesis.

Dr. W. J. O'DONOVAN (London) pleaded for a more careful definition of "allergy" and of "hepatic insufficiency" than Dr. Barber had allowed. There were multitudinous ways of injuring the human system but few reactions, and he thought the way we reacted was Mendelian. There might be many causes for one disease which was a pattern reaction.

Dr. J. BEATTY (Cardiff) thought that liver insufficiency was too big a thing to have attributed to it one group of diseases alone. The liver was a microcosm of the body and would be disordered in any form of disease. Ephedrine might have an effect on intractable cases of urticaria, and atropine might be even better. Identical results would follow the prolonged administration of any kind of protoplasmic poison. It was a local skin weakness that determined the onset of urticaria rather than any other reaction to a protoplasmic poison released by hepatic inadequacy.

After several questions Dr. BARBER, in reply, pointed out that they had not claimed to have discovered the cause of urticaria, but had simply nvestigated the biochemistry of the allergic state. The causation was a much more complicated matter. llergic symptoms were common in liver disease—rurigo and itching, for example. One of the functions these allergic people was wrong, either from heredity r some other cause. Amino-acid estimations had been done in a very long list of other diseases. There was an initial acidosis in allergic states, and bicarbonate of soda might stop this. The calcium factor entered in relation to the vegetative nervous system; the irritability of the sympathetic largely depended on the calcium content. Protein therapy acted by desensitisation and preventing anaphylaxis. The liver was in some way responsible for anaphylaxis. The liver which could not be produced if the liver were cut out. He had used ephedrine and atropine, which undoubtedly acted through the parasympathetic system, on which the symptoms depended. Adrenalin acted on one phase only of the anaphylactic state. He thought it unjustifiable at present to speak of reatment.

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was appointed medical officer to the Garw Valley Collieries, and remained connected with these collieries until 1916, when he resigned on grounds of ill-health. Dr. Parry was keenly interested in the welfare of miners and in the educational facilities available for their children, and did his utmost to improve conditions of hygiene in the mines. He was a J.P. of Glamorgan for many years, and at the time of his death was one of the senior magistrates in the county. During the war he acted as chairman of the Medical Recruiting Board for Glamorgan. He was a member of the first county council elected for Glamorgan and served on several other public bodies in the county.

Dr. HENRY WILLIAM JACOB died at Malvern on August 31st after a long illness. He had practised in Malvern since 1895, and of recent years had devoted much time to municipal affairs as chairman of the urban district council. Born in Dublin in 1866, Dr. Jacob studied science and then medicine at Trinity College, Dublin, taking his M.A. with a gold medal in natural science in 1890. He qualified M.D., B.Ch. and B.A. in the same year, and became a medical resident at the Adelaide Hospital, Dublin, and later house surgeon to the General Hospital, Birmingham. He practised at Taunton for a few years, when he acted as honorary physician to the Taunton and Somerset Hospital, and then moved to Malvern, where he soon became interested in the movement for developing the town and extending its amenities. His policy on the urban district council was progressive and vigorous, and the improvement in housing conditions and the provision of a public park and swimming baths in Malvern are largely due to his influence.

DONATIONS AND BEQUESTS.—Mrs. R. M. Bradshaw, of Mold, Flint, left £1000 to Liverpool Royal Infirmary for the endowment of a bed in memory of her late husband, Dr. Thomas Robert Bradshaw, consulting physician to the infirmary.—Mrs. F. W. L. Giles, Netherhall-gardens, Hampstead, left, subject to the life interest of her son, the ultimate residue of her property, about £10,000, to be applied for the general purposes of the mental hospital known as Cheadle Royal, Cheadle, Cheshire.—Miss E. M. Clauson-Thue, of Bournemouth, left the bulk of an estate of over £85,000 to charitable institutions. Amongst the bequests were £1000 to the Victoria Hospital, Bournemouth, for an "Edith Clauson-Thue bed"; £1000 to the Miller Hospital, Greenwich, to endow a "William Clauson-Thue bed" in memory of her father; £500 each to the London Homœopathic Hospital, the Royal Blind Pension Society, and the London Association for the Blind; £250 each to the British Home for Incurables, Streatham, and the Infant Orphan Asylum, Wanstead. After the death of a legatee the Hospital for Children, Great Ormond-street, the London Orphan Asylum, Watford, the Hospital for Consumption, Brompton, and the Evelina Hospital, Southwark, will each receive £720.—Mrs. A. Archer, Bournemouth, left £300 to the Royal Victoria and West Hants Hospital.—Mr. David McCausland, Belfast, left the residue of his property to his wife for life and then £1000 each to the Victoria Hospital, Belfast, the Ulster Hospital for Women and Children, the Children's Hospital, Queen-street, Belfast, the Incorporated Cripples' Institute, and Dr. Barnardo's Homes.—Dr. Frederick Durham left £100 each to the Royal Medical Benevolent Fund, the Royal Hospital and Home for Incurables, Putney, and the Northampton General Hospital.—Mr. William Foley, Birmingham, left £1000 to a legatee for life and then to be divided between the Birmingham General Hospital and Queen's Hospital, Birmingham. The residue to his wife for life and on her death, after other bequests, one-fifth each to the Royal Cripples' Hospital, Birmingham, the Birmingham and Midland Eye Hospital, Birmingham, the Birmingham and Midland Hospital for Women, the Birmingham General Dispensary, and one-fifth between the Birmingham General Hospital and Queen's Hospital, Birmingham.—Mr. Henry Charles Summers, of Forest Hill, London, left £500 to the London Hospital and £3000 to such charitable institution or institutions (and in such proportions) in England as the executors may select.—Sir William Forrest, of Leeds, left £1000 each to the Leeds General Infirmary and the Bradford Infirmary, and £500 to the Bradford Eye and Ear Hospital.—Mr. W. J. Boothroyd, chairman of the Board of Management of the Southport Infirmary, is contributing £1000 towards the cost of the extension of the institution.

Correspondence.

"Audi alteram partem."

EPIDEMIC (LETHARGIC) ENCEPHALITIS

To the Editor of THE LANCET.

SIR,—From your leading article of June 30t (p. 1333), and your annotation of Sept. 1st (p. 457 on the later manifestations of this disease, it is eviden that if we trace the after-histories of a group of patients who have suffered from an acute illness recognised as lethargic encephalitis, the conclusions we must come to are gloomy enough. The position, however, is even more serious than these analyses would suggest. If the relative numbers coming under my own observation are approximately those occurring over the whole country, there are a large number of cases who present no such history of initial illness and are, it seems, liable to escape timely recognition. They labour under some such diagnosis as "nervousness," "neurasthenia," "muscular weakness," or even, as in one case which came under my notice, "a puir cratur." Many of them are such a burden on their relatives that it is not to be wondered at if domestic sympathy is often strained to breaking point.

As you rightly point out, there are several different organisations under whose care these unfortunates may come and it is to be feared that each one, having other sheep to tend, may hope to see the unprofitable ones fed by another flockmaster. It is not inapposite to call these sufferers sheep, because their bearing suggests nothing else so much as that of a dumb animal. Indeed, they seem bereft of those very characteristics which have established man's supremacy in the animal kingdom. They even have difficulty in maintaining the erect posture. Here is a disease capable of taking frightful toll of its victims in mental deficiency and even criminal lunacy. It is notifiable and it is an undoubted fact that notification creates the impression that the body responsible for the care of a patient is the public health authority. That this is so in the acute stage, when the disease assumes epidemic proportions, is clear, but the real problem, and the lasting problem, is the care of the chronic encephalitic. When he is a certifiable lunatic, with or without criminal tendencies, he is comparatively easily disposed of. It is in the stage preceding this that he is so difficult to deal with and to the majority of these patients, I believe, benefit would accrue from institutional treatment. There is no occasion to put them in the infectious diseases' hospital; the voluntary hospitals are full and overflowing with patients of every description and the parochial hospitals do not carry either the atmosphere or the personnel to treat satisfactorily so highly specialised a condition. What is wanted is a hospital devoted to it alone.

The available accommodation under public authority at present is deplorably inadequate, and the matter is one of some urgency. In the last few months I have noted an instance of a girl standing in risk of her life in the middle of a crowded thoroughfare completely "mazed" who, when asked what she was doing, replied, "Would you show me the way to the infirmary?" Another case was that of a young man found wandering on the railway. Both of these are chronic encephalitics and I have no doubt such occurrences could be duplicated all over the country. It can scarcely be anticipated that effective prevention against this disease will appear for many years, and I would like to see the establishment at suitable points of encephalitic settlements. Scarcely a week passes but that some country house, whose owner feels the burden of existing rates too heavy, comes into the estate market. The acquisition and utilisation of such houses, each accommodating, say, 50 patients, would not, I think, be an insuperable difficulty. At tive dermatitis; over 40 "cold" abscesses had been opened and had yielded *Staphylococcus aureus*. Another patient had developed cutaneous and subcutaneous necroses, perforation of the nasal septum, and arsenical exfoliative dermatitis; his urine had contained *B. proteus*. Another man had had exfoliative dermatitis, had become very ill with fever and albuminuria, and his nasal septum had perforated. During convalescence he had had small boils and had then died of pulmonary embolism. Dr. O'Donovan felt it important that these uncommon ill-effects should be known, so that the practitioner learned not to use salvarsan unless there were facilities for transferring patients to hospital.

Dr. **Barber** asked if Dr. O'Donovan had tried preliminary large doses of glucose and alkali in sensitive cases; he believed this would prevent many toxic effects.

Dr. **Hallam** asked if sodium thiocyanate had been used for the dermatitis; he himself had not been quite satisfied with it.

The **Chairman** recalled extraordinary pigmentations after the dermatitis, and concluded that most of the dermatological troubles were due to too frequent doses of the drug.

Dr. **O'Donovan**, in reply, said he had no idea which patients were going to prove susceptible. It was not the poor, half-starved patients who proved sensitive. He had no confidence in sodium thiocyanate, though he continued to use it.

Corrigendum.—In the discussion on the Treatment of Diphtheria (The Lancet, Sept. 8th, p. 517) Dr. E. W. Goodall is reported as having tried antitoxin in doses up to 200,000 units. The figure should have been 100,000 units.

Obituary.

CRESSY LIVINGSTON WILBUR,

M.D. New York.

The death of Dr. Wilbur from pneumonia on August 9th has removed America's pioneer vital statistician. He was in his sixty-fourth year, having been born at Hillsdale, Michigan, the son of Rodney Wilbur and Frances Cressy. He studied medicine at the University of Michigan, qualifying from the Bellevue Hospital Medical College of New York in 1890, and from 1893 to 1905 he was in charge of the Division of Vital Statistics of the Michigan State Department of Health. It was Wilbur who drafted a model vital statistics law and helped to secure its adoption by several of the American States; he was also responsible for the standard death certificate now in general use. From 1906 to 1914 Wilbur was Chief Statistician of the Division of Vital Statistics of the U.S. Bureau of Census and it fell to his lot to edit two international manuals of causes of death. In 1914 Dr. Hermann Biggs, then newly appointed to the position he made so famous, secured the services of Wilbur for New York State, but failing health compelled him to resign this post two years later. Dr. Wilbur leaves many indelible impressions of his foresight and energy in the statistical legislation of the United States.

NANCY MABEL HIELD, M.B., B.S. Lond.

Dr. Nancy Hield, who died at her home in Highgate on Sept. 6th, was born in 1899, the younger daughter of the late John Heaton Hield and of Harriet Hield. She entered the London (Royal Free Hospital) School of Medicine for Women in 1917, and qualified M.B., B.S. Lond., in the spring of 1923, having also in this time passed the Primary Fellowship Examination. She was among the prize winners of her year, obtained a resident post at the Elizabeth Garrett Anderson Hospital immediately after qualification, and became successively house surgeon and casualty officer at the Royal Free Hospital, and house surgeon at the Cancer Hospital. She was later appointed clinical assistant to surgical out-patients at the Hospital for Sick Children, Great Ormond-street, and medical officer to the North Islington Welfare Centre. In 1925 she became M.R.C.S. Eng., L.R.C.P. Lond. She took a keen interest in her profession and particularly in the surgical side of it. It was while acting as surgical registrar at the Royal Free Hospital during the summer of 1927, and working for the Fellowship of the Royal College of Surgeons, that she became aware that her health was definitely impaired, and it was decided that she should undergo an operation for the removal of a thoracic growth. Later a definite diagnosis of lymphadenoma was possible. It was a cause of great distress to her that she should be compelled to relinquish any of her work, and in spite of considerable difficulties she continued part of it up to within a few weeks of her untimely death. A friend writes:—

"Though Dr. Nancy Hield was devoted to her profession, and an indefatigable worker, she had a zest for enjoyment, and shared fully in the diversions of her friends, whether at the hospital or in the home circle. She enjoyed dancing and tennis, and pleasant outings and pretty things, and of private theatricals she had an extensive experience. She was endeared to her many friends by a lively sense of humour, never more happily exercised than in describing experiences in the hospital casualty department. Responsibility put on her naturally impulsive and affectionate nature a certain reserve; but below that reserve lurked an unfailing sympathy with misfortune and suffering, and the warmest attachment to her chosen friends, among whom must be numbered a cocker spaniel, 'Mr. Brown,' acquired just before her last illness declared itself. Nancy Hield had strong opinions, especially on professional matters, and expressed herself with directness and force on such questions as the desirability of co-education in the medical schools. She was not tolerant of insincerity or false sentiment and apt to be impatient of obstructions. Perhaps for this reason even her closest friends were surprised by the stoic fortitude with which she faced a situation she knew must end fatally for herself. The nature of her illness could not be a mystery to her, but she bore with quiet dignity, through long distressing months, not only physical suffering but the knowledge of untimely closure of a career which had been full of promise and interest. She never let her courage or composure fail. It was as if she had resolved that her profession, which had no reason to be ashamed of her career, should also have no reason to be less than proud of her at its close."

John Davidson, M.B. Lond., whose death occurred last month at his home in Uxbridge, was born in 1858. He received his medical education at King's College Hospital, where he qualified M.R.C.S. Eng. and L.S.A. in 1879 and took his M.B. Lond. with honours in 1881. He served the hospital as resident accoucheur and also as house surgeon to Lord Lister. In 1882 he became a junior partner in a firm of practitioners at Uxbridge and in due course was appointed medical officer to the Uxbridge Joint Isolation Hospital and to the Hillingdon and Uxbridge Cottage Hospital, a post he held for 36 years. Dr. Davidson worked in Uxbridge for over 40 years, and on his retirement in 1925 a presentation was made to him by his patients and friends. His professional activities did not exclude other interests. He was an amateur actor and elocutionist of some merit and played cricket and bowls with enthusiasm and skill. He was a well-known climber and a member of the Alpine Club.

Dr. Edward John Parry, who died at his home in Dinas Powis on Sept. 3rd, aged 78, studied medicine in Edinburgh and qualified L.R.C.P., L.R.C.S. Edin. in 1879, becoming M.D. R.U.I. in 1881. On settling down to practice in his native country he was appointed medical officer to the Garw Valley Collieries, and remained connected with these collieries until 1916, when he resigned on grounds of ill-health. Dr. Parry was keenly interested in the welfare of miners and in the educational facilities available for their children, and did his utmost to nprove conditions of hygiene in the mines. He was J.P. of Glamorgan for many years, and at the time of his death was one of the senior magistrates in the county. During the war he acted as chairman of the Medical Recruiting Board for Glamorgan. He was a member of the first county council elected for Glamorgan and served on several other public bodies in the county.

Dr. HENRY WILLIAM JACOB died at Malvern on August 31st after a long illness. He had practised in Malvern since 1895, and of recent years had devoted much time to municipal affairs as chairman of the urban district council. Born in Dublin in 1866, Dr. Jacob studied science and then medicine at Trinity College, Dublin, taking his M.A. with a gold medal in natural science in 1890. He qualified M.D., B.Ch. and B.A. in the same year, and became a medical resident at the Adelaide Hospital, Dublin, and later house surgeon to the General Hospital, Birmingham. He practised at Taunton for a few years, when he acted as honorary physician to the Taunton and Somerset Hospital, and then moved to Malvern, where he soon became interested in the movement for developing the town and extending its amenities. His policy on the urban district council was progressive and vigorous, and the improvement in housing conditions and the provision of a public park and swimming baths in Malvern are largely due to his influence.

DONATIONS AND BEQUESTS.—Mrs. R. M. Bradshaw, f Mold, Flint, left £1000 to Liverpool Royal Infirmary for he endowment of a bed in memory of her late husband, r. Thomas Robert Bradshaw, consulting physician to e infirmary.—Mrs. F. W. L. Giles, Netherhall-gardens, mpstead, left, subject to the life interest of her son, the ultimate residue of her property, about £10,000, to be applied for the general purposes of the mental hospital known as Cheadle Royal, Cheadle, Cheshire.—Miss E. M. Clauson-Thue, of Bournemouth, left the bulk of an estate of over £85,000 to charitable institutions. Amongst the bequests were £1000 to the Victoria Hospital, Bournemouth, for an "Edith Clauson-Thue bed"; £1000 to the Miller Hospital, Greenwich, to endow a "William Clauson-Thue bed", in memory of her father; £500 each to the London Homœopathic Hospital, the Royal Blind Pension Society, and the London Association for the Blind; £250 each to the British Home for Incurables, Streatham, and the Infant Orphan Asylum, Wanstead. After the death of a legatee the Hospital for Children, Great Ormond-street, the London Orphan Asylum, Watford, the Hospital for Consumption, Brompton, and the Evelina Hospital, Southwark, will each receive £720.—Mrs. A. Archer, Bournemouth, left £300 to the Royal Victoria and West Hants Hospital.—Mr. David McCausland, Belfast, left the residue of his property to his wife for life and then £1000 each to the Victoria Hospital, Belfast, the Ulster Hospital for Women and Children, the Children's Hospital, Queen-street, Belfast, the Incorporated Cripples' Institute, and Dr. Barnardo's Homes.—Dr. Frederick Durham left £100 each to the Royal Medical Benevolent Fund, the Royal Hospital and Home for Incurables, Putney, and the Northampton General Hospital.—Mr. William Foley, Birmingham, left £1000 to a legatee for life and then to be divided between the Birmingham General Hospital and Queen's Hospital, Birmingham. The residue to his wife for life and on her death, after other bequests, one-fifth each to the Royal Cripples' Hospital, Birmingham, the Birmingham and Midland Eye Hospital, Birmingham, the Birmingham and Midland Hospital for Women, the Birmingham General Dispensary, and one-fifth between the Birmingham General Hospital and Queen's Hospital, Birmingham.—Mr. Henry Charles Summers, of Forest Hill, London, left £500 to the London Hospital and £3000 to such charitable institution or institutions (and in such proportions) in England as the executors may select.—Sir William Forrest, of Leeds, left £1000 each to the Leeds General Infirmary and the Bradford Infirmary, and £500 to the Bradford Eye and Ear Hospital.—Mr. W. J. Boothroyd, chairman of the Board of Management of the Southport Infirmary, is contributing £1000 towards the cost of the extension of the institution.

Correspondence.

"Audi alteram partem."

EPIDEMIC (LETHARGIC) ENCEPHALITIS.

To the Editor of THE LANCET.

SIR,—From your leading article of June 30th (p. 1333), and your annotation of Sept. 1st (p. 457) on the later manifestations of this disease, it is evident that if we trace the after-histories of a group of patients who have suffered from an acute illness recognised as lethargic encephalitis, the conclusions we must come to are gloomy enough. The position, however, is even more serious than these analyses would suggest. If the relative numbers coming under my own observation are approximately those occurring over the whole country, there are a large number of cases who present no such history of initial illness and are, it seems, liable to escape timely recognition. They labour under some such diagnosis as "nervousness," "neurasthenia," "muscular weakness," or even, as in one case which came under my notice, "a puir cratur." Many of them are such a burden on their relatives that it is not to be wondered at if domestic sympathy is often strained to breaking point.

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The available accommodation under public authority at present is deplorably inadequate, and the matter is one of some urgency. In the last few months I have noted an instance of a girl standing in risk of her life in the middle of a crowded thoroughfare completely "mazed," who, when asked what she was doing, replied, "Would you show me the way to the infirmary?" Another case was that of a young man found wandering on the railway. Both of these are chronic encephalitics and I have no doubt such occurrences could be duplicated all over the country. It can scarcely be anticipated that effective prevention against this disease will appear for many years, and I would like to see the establishment at suitable points of encephalitic settlements. Scarcely a week passes but that some country house, whose owner feels the burden of existing rates too heavy, comes into the estate market. The acquisition and utilisation of such houses, each accommodating, say, 50 patients, would not, I think, be an insuperable difficulty. At present it is impossible to do anything to restore the broken faculties of the encephalitic and any measures designed to prevent the onset of complete mental decrepitude in these sufferers are worthy of sympathetic study.

I am, Sir, yours faithfully,

Dundee, Sept. 7th, 1928. J. M. STALKER.

⁂ The situation is to some extent met in London where the Metropolitan Asylums Board has for the past three years allotted 100 beds at the Northern Hospital, Winchmore Hill, for children 3–16 years of age suffering from the after-effects of epidemic encephalitis. These beds, it seems, are now not fully occupied.—ED. L.

THE LATER RESULTS OF PARTIAL GASTRECTOMY FOR GASTRIC AND DUODENAL ULCER.

To the Editor of THE LANCET.

SIR,—In Mr. Flint's letter (p. 478) it is stated that no less an authority than Sir Berkeley Moynihan "has never seen an anastomotic ulcer develop after primary gastrectomy" for gastric ulcer. I have had one such case under my care.

A woman, aged 42, was operated upon by myself on May 23rd, 1923, for a gastric ulcer high up on the lesser curvature by the antero-Polya method. She remained perfectly well for two years. In June, 1925, she commenced having pain after food on the left side of her abdomen radiating round to the back. During these attacks, which lasted about three weeks, she vomited and thus relieved the pain. She vomited blood on two occasions. The intermissions between the attacks varied from four to six weeks. After admission to hospital X ray examination showed nothing very definite, but the history was so suggestive that on June 29th, 1926, a few days after blood transfusion, I operated upon her again. I found definite thickening of the anterior surface of the anastomosis in its lower third near the greater curvature of the stomach and extending into the jejunum. No definite ulcer could be felt, there was no narrowing of the orifice, there was no ulcer in the stump of the stomach. I excised the thickened portion and to the naked eye it appeared a typical anastomotic ulcer. It was examined at once by the pathologist, who reported that he thought a fragment of foreign body was present (? thread). Microscopically there was granulation tissue with many giant cells, but no definite ulceration was found. I reconstructed the anastomosis and made an entero-anastomosis between the entering and returning limb of the jejunum.

I have heard from this woman to-day stating, "since my operation in 1926 my health is generally much improved. I have had no pain or indigestion since." This is the only case that has come under my notice in a considerable number of gastrectomy cases for chronic gastric ulcer. Thread was used in this case for stitching the sero-muscular coats.

I am, Sir, yours faithfully,

Sheffield, Sept. 5th, 1928. ERNEST FINCH.

BLEPHARITIS SUCCESSFULLY TREATED BY AN AUTOGENOUS ANTIVIRUS.

To the Editor of THE LANCET.

SIR,—A woman sent to me for bacteriological treatment by one of the surgeons of the Central London Ophthalmic Hospital had been troubled with blepharitis for a number of years. For some time past the disease had been getting worse, so that when I first saw her it had reached a stage when it was seriously interfering with the ordinary routine of her life. Staphylococci were the only bacteria demonstrated in material taken repeatedly from the inflamed areas. Treatment was carried out by four distinct bacteriological methods, only one of which proved efficacious. The first method used was the administration of subcutaneous inoculations of stock polyvalent staphylococcus vaccine. This vaccine, having failed to produce any improvement in the condition, an autogenous vaccine was made and administered without any more favourable result. It was then determined to try the effect of Besredka's antivirus therapy. A stock antivirus was employed and handed over to the patient with the instructions as to its application. Although this particular batch of antivirus had given promising results in similar cases on former occasions, it failed to ameliorate the condition. At this stage the patient became sceptical as to the value of any treatment, and it was difficult to persuade her to continued efforts. However, she consented to have an autogenous antivirus prepared and applied, and within 24 hours of its first application in the form of a lotion to the affected parts improvement in signs and symptoms became manifest. Persistent treatment has led to what appears to be a cure of the condition.

In view of the intractable nature of the disease in question the case appears worthy of notice. It affords a near approach to a crucial experiment. The element of suggestion can certainly be eliminated, since the patient's faith had been reduced to a minimum or even to a negative quantity by a series of failures. The results obtained in this case, coupled with experience in other less dramatic cases, suggest that treatment by autogenous antivirus preparations should be tried in certain forms of eye disease.

I am, Sir, yours faithfully,

W. E. M. ARMSTRONG, M.D.

Weymouth-street, W., August 28th, 1928.

PAPWORTH COLONY AND SANATORIUM TREATMENT.

To the Editor of THE LANCET.

SIR,—Certain newspapers appear to have given the impression that in my address at Dublin I attacked sanatoria, but I can assure Dr. Walters that this was not the case. What I did say, and indeed have been saying for years, is that in a great number of cases the benefits of sanatorium treatment alone cannot be more than temporary and that the village settlement is an after-care scheme which meets all the requirements of the consumptive worker. Papworth exists entirely because it was found impossible for patients to follow the advice of the profession after they had had sanatorium treatment and returned to their homes. Public opinion and economic necessity are the principal enemies of the discharged sanatorium patient. At Papworth neither enemy is present, and consequently we are able to see what happens when the advice of the medical profession can be followed. That the results have been so entirely satisfactory is a welcome indication that the profession has made no mistake in this matter. The only difficulty is to convince people that to maintain sanatoria without village settlement is to put into practice only half the advice of the profession, and therefore to achieve results which cannot help being grossly disappointing.

I am, Sir, yours faithfully,

P. C. VARRIER-JONES,
Medical Director, Papworth Village Settlement.

Sept. 6th, 1928.

INSOLATION IN PULMONARY TUBERCLE.

To the Editor of THE LANCET.

SIR,—May I recall the attention of my colleagues to a point in the treatment of phthisis which seems to me in process of being overlooked—namely, that direct sunshine is a source of danger to patients who have not been warned to keep out of it? Doctors who only occasionally see cases of pulmonary tubercle do not get the opportunity of noting the deplorable results which may follow one "sun bath," and this in a patient who before was doing well in every way. Certainly, medical students do not recognise the danger, for they use the phrase "plenty of sunlight" when prescribing treatment, and the same idea is conveyed in some of the smaller text-books of medicine. As a patient in two sanatoria I have seen pyrexia, increased sputum, pleurisy, and hæmoptysis follow the first spell of fine summer weather, and I have observed in myself increased languor and malaise. Later on in summer, when the skin has become heavily pigmented, the risk of harm from the sun may be less, and for some reason harm s less likely to follow from walking in the sun than itting in it; but the danger to many patients is lways there, and those who have learned by experi- ice prefer to sit in the shade.

I am, Sir, yours faithfully,

August 30th, 1928.

M.R.C.S.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments are notified:—Surg. Comdrs. E. B. Kelley to *Champion*; W. P. Vicary to *Erebus*; and M. J. Aitken to *Calliope*. Surg. Lieut.-Comdrs. S. R. Johnston to *Caradoc* (on recommg.); S. G. Rainsford to *Centurion*; R. W. Nesbitt to *Victory*, for R.N. Hospital, Haslar, temp., and as medical Specialist; F. L. H. McDowel, T. N. D'Arcy, A. G. Bee, C. H. Savory, and G. G. Newman to *President*, for course of instruction; and T. Madill to *Victory*, for Royal Marine Infirmary, Portsmouth. Surg. Lieuts. E. V. Barnes to *Erebus*; A. A. Pomfret to *St. Vincent*; R. W. Mussen to *Danae*; E. J. K. Weeks to *Victory*, for R.N. Barracks, Portsmouth; H. W. Strong to *Fisgard*; W. J. Doody to *Calliope* and to *Cleopatra*; W. A. Hopkins to *Pembroke*, for R.N. Hospital, Chatham; D. M. Beaton to *Sutton*; P. H. Deeny to *Endeavour*, and on recommg.; D. R. Campbell to *Suffolk*; O. Watson to *Iroquois*; A. P. Anderson-Stuart to *Benbow*; and L. P. Sayers to *Godetia*.

Entries: M. A. Graham-Yooll has been entered as Surgn. Lieut., R.N., for Short Service, and apptd. to *Victory*, for R.N. Hospital, Haslar, for course of instruction, and R. E. G. Richmond has been entered as Surgn. Lieut., R.N., for Short Service, and apptd. to *Victory*, for R.N. Hospital, Haslar, for course of instruction.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Comdr. A. E. W. Hird, V.D., to *Victory*, for R.N. Hospital, Haslar, for training.

Proby. Surgn. Sub-Lieuts. R. M. B. Lewis and D. M. Craig to *Victory* for R.N. Hospital, Haslar, for training.

Surg. Lieut. H. G. Ungley, to *Victory*, for R.N. Hospital, Haslar, for training, and R. Russell to *Victory*, for R.N. Hospital, Haslar, for training, and to *Tiger*, to complete training.

ROYAL ARMY MEDICAL CORPS.

Maj. (Bt. Lt.-Col.) (temp. Col.) G. de la Cour, O.B.E., to be Lt.-Col., and to be supern. in that rank whilst holding the appt. of Consulting Surg. to the British Army.

Capt. A. H. Clarke, M.C., to be Maj. (Prov.).

The undermentioned to be temp. Lts.: G. F. Maher, A. R. Cowan.

General List: C. H. Wilson (late Surg. Sub-Lt., R.N.V.R.), to be Lt.

MILITIA.

Capt. L. A. B. Moore to be Maj.

ROYAL AIR FORCE.

The undermentioned Flying Officers are promoted to the rank of Flight Lt.: C. W. Coffey, J. Hutchieson.

Flight Lt. E. J. Mockler is granted a permanent commission in this rank.

INDIAN MEDICAL SERVICE.

Lt.-Col. S. H. Middleton-West, M.C., retires.

COLONIAL MEDICAL SERVICES.

H. R. Dive, Medical Officer, Federated Malay States, has been promoted to be Senior Medical Officer, Pahang.

The following appointments are notified: N. Chilton, Medical Officer, Tanganyika Territory; R. F. Pinson, W. Hunter, C. E. G. Nunns, Medical Officers, West African Medical Staff; F. J. Farr, Radiologist, Electrologist Medical Dept., Hong-Kong; A. J. McKinlay, Assist. Medical Supt., Lunatic Asylum, Barbados; A. W. Carleton, Colonial Surgeon, St. Helena.

ST. MARY'S HOSPITAL (PADDINGTON) RUBBISH COLLECTION FUND.—This fund, which was started on July 1st, 1927, had by the end of the year produced £380. The annual report asks the public to notify the hospital when old clothes, linen, &c., are available for collection.

Medical News.

UNIVERSITY OF LONDON.—The Connaught Hall of Residence at 14, Bedford-place, London, W.C. 1, recently presented to the University of London by the Duke of Connaught, will be ready for students of any of the colleges and schools of the University at the opening of the session in October. Mr. W. S. Angus has been appointed warden and Miss Burnett matron.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At a meeting on Sept. 3rd, Sir Arthur Keith, F.R.S., was admitted to the Honorary Fellowship, and Dr. Samuel McMahon to the Fellowship, after examination.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—The anniversary dinner will be held at the Hotel Victoria, Northumberland-avenue, at 7 P.M., on Wednesday, Oct. 3rd.

ROYAL DENTAL HOSPITAL OF LONDON.—The dinner of the past and present students will be held at the Trocadero Restaurant (Empire Rooms) on Oct. 20th, at 7 P.M. Mr. G. G. Campion will preside.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.—Prizes will be distributed in the Out-patients' Hall of the hospital by Dr. T. Watts Eden on Thursday, Oct. 4th, at 3.30 P.M., to be followed by a reception at the school.

MIDDLESEX HOSPITAL MEDICAL SCHOOL.—The winter session will open on Tuesday, Oct. 2nd, when the introductory address will be delivered at 3 P.M. in the Queen's Hall by Mr. A. E. Webb-Johnson. Prizes will be distributed by Prince Arthur of Connaught, and Princess Arthur will present the Fardon Memorial Medals. The annual dinner will be held the same evening at 7.30 P.M., at the Savoy Hotel, when the chair will be taken by Prince Arthur.

THE first number of a new monthly journal, intended to keep members of the medical profession in touch with the latest developments in artificial sunlight therapy, medical radiology, and electrology, will be published on Oct. 1st. under the title, *The Actinic Practitioner and Electrotherapist*. Price 6*d*. Publishing offices at 139, High Holborn, London, W.C. 1.

MINERS' HOSPITAL, CAERPHILLY.—Extensions estimated to cost £40,000 are now being made to the Miners' Hospital, Caerphilly, South Wales. Accommodation for 50 new beds will be available when they are completed.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Four post-graduate courses are due to begin on Sept. 17th, each of them lasting for two weeks. Medicine, surgery, and the specialties will be dealt with at the Westminster Hospital, the whole of each day being occupied with lectures, demonstrations, and operations. The course in orthopædics to be held at the Royal National Orthopædic Hospital will also occupy the whole of each day, and that on diseases of children at the Queen's Hospital for Children, Bethnal Green. The course on diseases of the eye at the Royal Eye Hospital, St. George's-circus, London, S.E. 1, will be held each afternoon at 3 P.M.

A CANADIAN MEDICAL TOUR.—The members of the Canadian Tuberculosis Association, who are on a tour of European institutions, visited King Edward VII. Sanatorium on Sept. 7th, and were entertained to lunch, followed by a lantern demonstration by Sir StClair Thomson, who related his 17 years' experience as laryngologist to the institution. Dr. F. H. Pratten (London, Ontario), in proposing a vote of thanks, mentioned that the lead given by Midhurst had been followed practically throughout Canada, and that every sanatorium in Canada now had a laryngologist on the staff, the larynx in every case being systematically examined.

PIGMENTATION OF SKIN AND TUBERCULOSIS.—On Sept. 5th, at the Annual Congress of the National Veterinary Medical Association held at Newcastle-on-Tyne, the relative immunity from tuberculosis of the dark-skinned Jewish races compared with the blondes of Northern Europe was discussed. Mr. W. C. Miller, of Edinburgh, said that there was authority for the statement that certain races of cattle possessed of a light-coloured coat and hide contracted tuberculosis more easily than those with dark coats when they were put together in infected places. This contention was in accord with the statement of other authorities who had been compiling statistics of tuberculosis in the human race. The blonde individual with auburn, silky hair, and pale, freckled skin of fine texture, showed a greater degree of susceptibility to infection with tuberculosis than those of the Jewish race.

Bradford Mental Hospital.—A new mental hospital is to be erected at Bradford at a cost of £132,000, to house 400 patients.

Glasgow Refraction Hospital.—A refraction hospital, under the control of a committee of qualified opticians, is about to be opened in Glasgow. The principal object of the institution will be the provision of free sight-testing facilities, and the supply of glasses in necessitous cases, while classes will be conducted in connexion with the diplomas of the British Optical Association and the Spectacle Makers' Company. Patients found to be suffering from disease of the eye will be advised where to obtain professional treatment.

Appointments.

Anderson, J. S., has been appointed by the City Council of Leeds, as Medical Superintendent of Seacroft Hospitals.

Bebbington, Evelyn F., M.B., Ch.B. Liverp., D.P.H., Assistant Medical Officer for Maternity and Infant Welfare at Northampton.

Hancock, A. C., M.B. Lond., M.R.C.S. Eng., L.R.C.P. Lond., D.P.H., Medical Superintendent at Kent County Mental Hospital, Barming Heath, Maidstone.

Henderson, A., M.B., Ch.B. St. And., Assistant Medical Officer of Health for the county of Aberdeenshire.

Sheffield Royal Hospital: **Allott, E. N.**, M.B., Ch.B., B.Sc., full-time Assistant Physiologist; **Callcutt, J. Shirley**, M.B., Ch.B., Resident Surgical Officer; **Beattie, Wm.**, M.B., Ch.B., Senior Casualty Officer; **Maxwell, C. G.**, M.B., B.Ch., B.A.O., First Assistant Casualty Officer; **Patterson, W. J.**, M.B., B.Ch., B.A.O., Second Assistant Casualty Officer; **Rainsford, C.**, M.B., B.Ch., B.A.O., First House Physician; **Flint, A. O.**, M.B., Ch.B., Second House Physician; **Hynes, W.**, M.B., Ch.B., M.R.C.S., L.R.C.P., First House Surgeon; **Lynn, Alan**, M.B., B.Ch., B.A.O., Second House Surgeon; **Alcock, Wm.**, M.B., Ch.B., Ophthalmic House Surgeon; and **Marwood, V.**, M.B., Ch.B., Aural House Surgeon.

Vacancies.

For further information refer to the advertisement columns.

All Saint's Hospital (For Genito-Urinary Diseases), 49–55, Vauxhall Bridge-road, S.W.—H.S. At rate of £150.

Bath, Somerset and Wilts Central Children's Orthopædic Hospital, Combe Park.—Asst. Res. M.O. At rate of £120.

Birmingham and Midland Eye Hospital, Church-street.—H.S. £110.

Birmingham City.—Asst. M.O. £750.

Birmingham General Hospital.—Asst. S. £50.

Birmingham, Highbury Hospital.—Jun. M.O. £300.

Birmingham, Queen's Hospital Medical School.—Res. Anæsthetist. £70–£100.

[illegible] *Windlesham-road.*—H.S. £50.

[illegible] 2nd Asst. M.O. £200.

[illegible] *folk General Hospital.*—Res. H.S. £180.

Cairo, Egyptian University Faculty of Medicine, Dental School.—Lecturer in Dental Prosthesis, &c. £E480.

Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.

Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Gt. Barrow.—Assist. M.O. £250.

Connaught Hospital, Orford-road, Walthamstow, E.—Sen. Res. H.S. At rate of £150. Also Jun. Res. H.S. and Res. H.P. Each at rate of £100.

Croydon, Mayday-road Hospital.—Res. Asst. M.O. £300.

Cyprus.—District M.O. £600.

Denbigh (near), North Wales Sanatorium.—Male Asst. Res. M.O. At rate of £200.

Derby, Derbyshire County Council.—Tuberculosis Officer. £750.

Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120. Also Hon. Asst. Aural Surg.

Gloucestershire County Council.—M.O. for Maternity and Child Welfare. £750.

Gloucester, Gloucestershire Royal Infirmary, &c.—H.P. At rate of £150.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. Also H.P. Each at rate of £100. Also Part-Time Jun. Cas. O. At rate of £150.

Jersey General Hospital and Poor-law Infirmary.—Res. M.O. £200.

Leamington Spa, Warneford, Leamington and S. Warwickshire General Hospital.—Hon. Asst. S.

Leeds, St. James' Hospital.—H.P. and S. £200.

Liverpool, Liverpool Eye and Ear Infirmary.—Hon. Asst. Surgeon to Ear, Nose and Throat Department.

Liverpool Sanatorium, Delamere Forest, Frodsham.—Asst. to Med. Supt. £250.

London Lock Hosp., 91, Dean-st., W.—H.S. At rate of £200.

London Temperance Hospital, Hampstead-road, N.W.—Res M.O. At rate of £175. Cas. O. At rate of £120. Also H.P. At rate of £100.

Macclesfield, Parkside Mental Hospital.—Res. Clin. Asst. £75.

Manchester, Maternity and Child Welfare Centres.—M.O. £600.

Manchester, Monsall Hospital.—1st Asst. M.O. £600.

Manchester, Royal Infirmary.—Res. M.O. £200. Also Asst. M.O. and Asst. S.O. Each £35. Also Asst. Surg. O. for Central Branch £75.

Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Sen. Res. M.O. Also Asst. Cas. O. At rate of £140 and £100 respectively.

Miller General Hospital for South-east London, Greenwich-road, S.E.—[illegible]

National [illegible] .—Asst. P.

Newcastle [illegible] *rham, College of Medicine.* Asst. [illegible]

Nottingha [illegible] *d Infirmary.*—Res. Asst. M.O. [illegible]

Plymouth Homœopathic and General Hospital.—H.S. At rate of £150.

Plymouth, South Devon and East Cornwall Hospital.—Cas. H.S. At rate of £100.

Prince of Wales's General Hospital, Tottenham, N.—H.S., Special H.S., and H.P. Each at rate of £120. Also Jun. H.S. and Jun. H.P. Each at rate of £90.

Queen's Hospital for Children, Hackney-road, E.—H.P. Also Cas. O. Each at rate of £100. Also Physician-in-Charge Skin Department.

Richmond, Surrey, Royal Hospital.—Sen. H.S. At rate of £150.

Royal Free Hospital, Gray's Inn-road, W.C.—Cas. O. £150.

Royal Northern Hospital, Holloway, N.—Res. M.O. £200.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. £150.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—Hon. S. [illegible]

Smethwick, [illegible] £600.

South Londc [illegible] *Clapham Common S.W.*—H.P. and 3 H.S.'s. Each at rate of £50.

Sudan Government Medical Department.—M.O. £E720.

Swansea Hospital.—Two H.S.'s. £150.

Swansea General and Eye Hospital.—Two Hon. Asst. S.'s.

Talgarth, near Brecon, South Wales Sanatorium, &c.—Asst. Res. M.O. £200.

West Bromwich and District General Hospital.—Cas. H.S. £200.

Weston-super-Mare Hospital.—Res. M.O. £130.

Willesden General Hospital, Harlesden, N.W.—Res. H.S. At rate of £100.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Dunstable (Bedfordshire) and Brighouse (York, West Riding).

The Home Secretary gives notice that in consequence of the death of Dr. J. E. Moorhouse, one of the Medical Referees under the Workmen's Compensation Act for the Stirling District of the Sheriffdom of Stirling, Dumbarton and Clackmannan, the appointment held by him is vacant. Applications for the post should be addressed to the Private Secretary, Scottish Office, Whitehall, London, S.W.1, and should reach him not later than Sept. 29th, 1928

Births, Marriages, and Deaths.

BIRTHS.

Brett.—On August 31st, the wife of Major Pierce Brett, M.B., R.A.M.C., Reserve of Officers, Churchfields, Salisbury, of a son.

Cane.—On Sept. 7th, at Reepham, the wife of Maurice H. Cane, M.R.C.S., of a daughter.

Fenton.—On Sept. 7th, the wife of W. J. C. Fenton, M.R.C.S., Mayors-lane, Barking, of a son.

Herman.—On Sept. 6th, at Tonbridge, the wife of A. E. Herman, F.R.C.S., of a daughter.

Haycraft.—On August 30th, at Cathedral-road, Cardiff, the wife of John Berry Haycraft, F.R.C.S. Eng., of a daughter.

Morley.—On August 28th, the wife of A. H. Morley, M.B., B.S. Lond., of a daughter.

Wishart.—On July 27th, at Toronto, Canada, the wife of D. E. Staunton Wishart, M.D., of a son.

MARRIAGES.

Cochrane—Asplin.—On Sept. 6th, at the Church of the Holy Cross, Milton, Northants, Thomas S. Cochrane, M.B., to Gwendolen May, daughter of Mr. and Mrs. Asplin, the Manor House, Milton.

Dickson—Souter.—On Sept. 5th, at King's College Chapel, Aberdeen, Alfred Thomson Barclay Dickson, M.B., Ch.B., to Isabel Elsie, eldest daughter of Prof. Alexander Souter, F.B.A., and Mrs. Souter, Humanity Manse, Aberdeen.

DEATHS.

Findlay.—[illegible] Findlay, M.B., C.M., of Nel[illegible]

Hield.—O[illegible] oma, [illegible] late Jo[illegible]

McCall.—[illegible] Graeme [illegible] aged 38.

Nash.—On Sept. 9th, at Queen Alexandra Military Hospital, Millbank, Colonel Llewellyn Thomas Manly Nash, L.R.C.P., late A.M.S., Richmond, Surrey, aged 67.

Parry.—On Sept. 3rd, at Dinas Powis, Cardiff, Edward John Parry, M.D., J.P., aged 78.

Wilson.—On Sept. 9th, at Fairwarp, Sussex, Albert Wilson, M.D. Edin.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

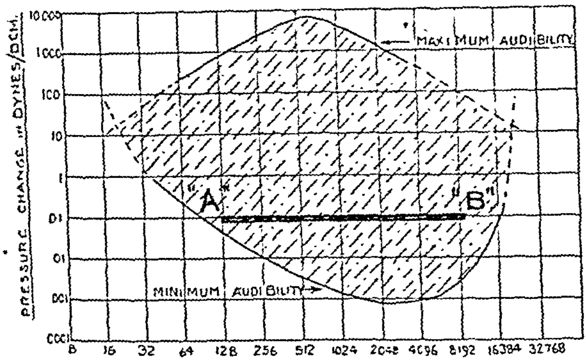
A GRAMOPHONE FOR THE DEAF.

By C. M. R. Balbi, A.M.I.E.E.

People who are not totally deaf but only "hard of hearing" are much isolated from their fellow beings because they are unable to hear general conversation. They suffer from an additional hardship if they also cannot hear instrumental or vocal music, since music can give especial pleasure to men whose life is spent for the most part in a world of silence.

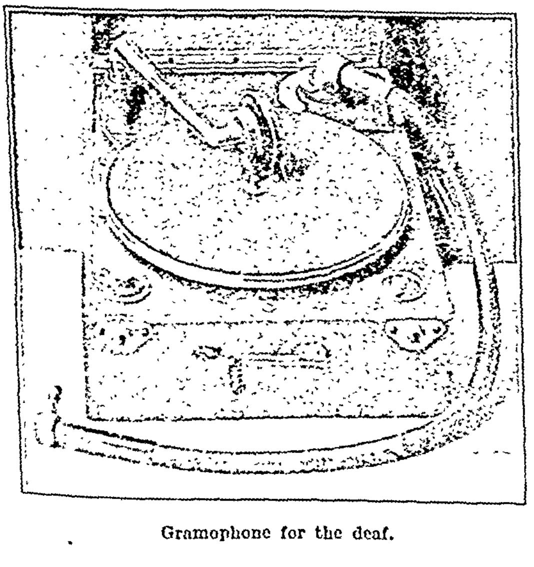
To meet the needs of those who are thus afflicted I have designed a gramophone which will produce a greater intensity than the ordinary instrument. The standard of sound intensity of an ordinary gramophone heard in a room is that of a piano or other musical instrument about equal. When this is expressed in the units of audiometric measurements * the standard may be said to vary about a mean of 0·1 dynes per sq. cm. (*root-mean-square pressure*) as represented by AB in the audiogram shown in Fig. 1.

Fig. 1.



Standard of sound intensity of a gramophone as represented by "A.B."

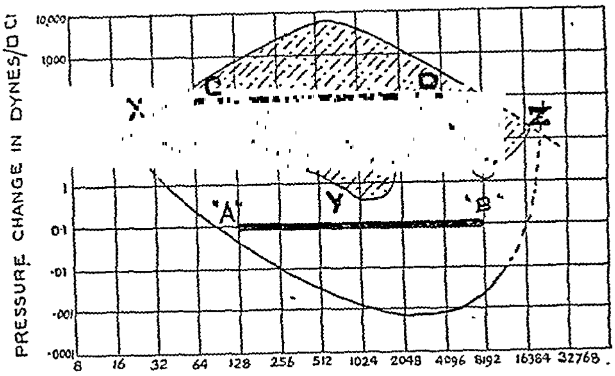
Fig. 4.



Gramophone for the deaf.

If we take an imaginary audiogram of a deaf person XYZ as shown in Fig. 2, then the level of the intensity AB would not be sufficient to make him hear. The intensity would have to be raised to the level CD—i.e., 100 dynes per sq. cm.—to make him hear, and means must be found to accomplish this. By examining the average intensity of sound at different points along the acoustic passages of a gramophone, such as are indicated in Fig. 3, it is found that the average intensities are as follows:—

Fig. 2.

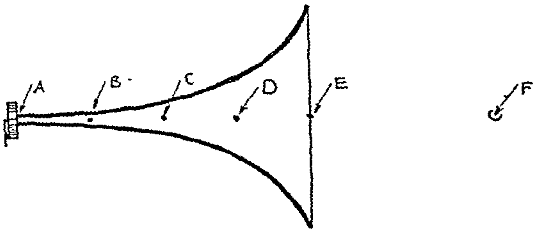


Standard of sound intensity required by a deaf person as represented by "CD."

Point A (sound-box)	.. ..	=*1100 dynes per sq. cm.*
„ B	.. ..	=1000 „ „
„ C	.. ..	= 100 „ „
„ D	.. ..	= 40 „ „
„ E (end of horn)	.. ..	= 10 „ „
„ F (6 ft. from end of horn)		= 0·1 „ „

The intensity at the point B in the horn would thus be more than sufficient to enable the deaf person represented by the audiogram XYZ to hear. It is an easy matter to tap the reproduced sound of the gramophone at this point and to conduct it to the ear of the sufferer by means of a flexible tube similar to that of a conversation tube.

Fig. 3.



Points in acoustic passages at which measurements were taken

This has been done, and in the special gramophone for the deaf which I have designed (Fig. 4) a further refinement has been added in the form of an adjustable volume control so that the deaf may regulate for themselves the intensity that suits them best. By listening at the special outlet provided the deaf are able to hear any recorded item or piece of music.

I have also designed on these principles a loud speaker which enables the deaf to obtain broadcast reception with the necessary apparatus.

"SOME CAUSES OF RACIAL DECAY."

In his Galton lecture delivered before the Eugenics Society on Feb. 16th last Mr. C. J. Bond inquired into the distribution of natural capacity in the population and the need for a national stocktaking. His interesting thesis was examined in a leading article which appeared in The Lancet of Feb. 25th (page 401). The lecture has now been reprinted by the People's League of Health in the form of an attractive pamphlet which can be obtained from the secretary of the League at 12, Stratford-place, London, W. 1, for 6d.

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* See The Lancet, 1925, i., 951.

STUDENT'S GUIDE: SESSION 1928-29.

ADDENDA.

African Medical Officers.—In addition to the membership of the West African Medical Staff, which is limited to British subjects of European parentage, there are a number of Government appointments for African medical officers in the West African Colonies. These appointments carry a salary on the scale £500-20-£600, and there is a higher scale, £600-30-£720. In addition, in Nigeria and on the Gold Coast, arrangements have been made for the employment of a few young African medical men temporarily on the hospital staffs, with a view to appointment to the Government service later, if suitable. In such cases a salary of £400 a year is paid.

Diploma in Bacteriology.—Dr. H. S. Raper, Dean of the Manchester Medical School, calls attention to the fact that a diploma in bacteriology has been granted by Manchester University for several years, with some candidates each year. While no mention was made of this on page 420, the fact was noted under the heading Victoria University of Manchester, on page 381, that a diploma in bacteriology is awarded by examination to registered medical practitioners.

Ancoats Hospital, Manchester.—No mention was made of this hospital among the hospitals offering educational facilities to Manchester medical students. The honorary staff of the Ancoats Hospital give both undergraduate and post-graduate clinical instruction and a fair number of students attend the out-patient clinics. The hospital contains 114 beds and deals with 20,000 accidents and urgency cases per annum. There are six resident posts open to men and women. The General Superintendent and Secretary is Mr. Herbert J. Dafforne.

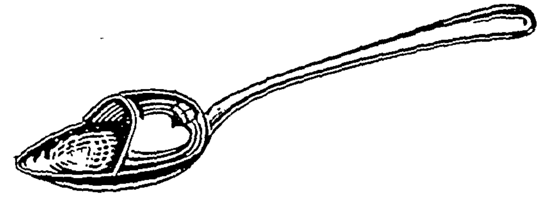
Since our Students' Guide was published a special number of the *Medical Officer* (Sept. 1st.) has appeared, containing full information as to degrees and diplomas in Public Health, along with an address on the Public Health Service as a career, by Dr. J. Howard Jones, President-elect of the Society of Medical Officers of Health.

The September issue of the *Edinburgh Medical Journal* is also a special educational number containing a concise guide (28 pages) to medical education in Scotland.

The *British Dental Journal* for Sept. 1st contains an address on Dentistry in its Relation to the Public Health Service, by Dr. W. M. Frazer and a supplement of 16 pages, giving the dental regulations adopted by the examining bodies and a useful idea of the cost of the dental curriculum in various centres.

A USEFUL SPOON.

THE "Verity" non-spilling spoon, of which we give an illustration, has been designed for administering medicine and other liquids to infants and invalids. In the ordinary horizontal position it holds one teaspoonful, and by tilting the spoon, or placing it upon the table after filling, the liquid runs into an enclosed part, from which it cannot be easily spilled. The inventor rightly believes that when an ordinary spoon is used for giving medicine to children a part of the dose is generally lost in transit, and sometimes too large a dose may be given because an inaccurate attempt has been made to compensate for this loss. Use of the "Verity" spoon should make for precision and should, incidentally, prevent sticky fluid from being spilt over clothing. It is obtainable at the price of 3*s.* post free from the sole distributors, Discon, Ltd., (Dept. S), 12, Henrietta-street, London, W.C. 2.



The "Verity" non-spilling spoon.

INDUSTRIAL METHYLATED SPIRIT AS A BEVERAGE.

IN the current number of the *Analyst* Mr. D. Henville, the Stepney public analyst, recalls the complaint of a number of persons charged with drunkenness at the Old-street Police Court last year that their symptoms were produced by the nature rather than the amount of the liquor imbibed. Neither methyl nor isopropyl alcohol, however, was found in the class of wine complained of and the abnormal symptoms remained unexplained. Early this year, however, it was noted that industrial methylated spirit was being sold in the district as a beverage, and the discovery confirms the repeatedly observed ill-effects of methyl alcohol whenever it is taken into the human system. Some time ago attention was called [1] to some work done in the United States, in which it was sought to show that methyl alcohol was a relatively harmless substance. Mr. Henville describes a technique for the detection of isopropyl alcohol, based on its oxidation to acetone and the identification of the latter by means of the nitro-prusside reaction, by which as little as 0·1 per cent. can be detected in a liquid containing 10 per cent. of ethyl alcohol.

A PAMPHLET ON DISEASE IN CHINA.

ANY medical man on his way to take up work in China, especially if for the first time, would do well (if he can read German) to study on the voyage a pamphlet on "The Epidemiology and Tropical Diseases of China" (pp. 69, with 13 of bibliography added, price about 5*s.*) by Dr. E. G. Nauck, being the latest supplement to the *Archiv für Schiffs- und Tropen-Hygiene.* Dr. Nauck, formerly of the Hamburg Institute and recently on the staff of the Union Medical College, Pekin, discusses the history, pathology, industrial origin, and treatment of most of the important diseases of China. Like most German authorities, he generously honours the memory of Manson, who showed how the problems of tropical medicine were to be solved. He notes that much of our knowledge is due to missionaries and that antimosquito regulations were made in Hong-Kong so long ago as 1900. By directing attention to the many lacunæ in our information, he stimulates the reader to aim at completing them.

NEW PREPARATIONS.

Calsoma.—This preparation, which comes from the Abbott Laboratories, North Chicago, consists of the tribasic phosphates of calcium and magnesium, combined with sodium biphosphate, and magnesium citrate in effervescent form. The intention has been to provide a neutralising agent for excessive acidity without producing alkalinity, and the drug has been found to be a valuable gastric antacid. In our issue of June 16th last, when our present knowledge of alkaline salts as therapeutic agents in gastric disease was briefly summarised, it was pointed out that careful laboratory experiments by Messrs. Freezer, Gibson, and Matthews, which were published in Guy's Hospital Reports, indicated tribasic magnesium phosphate to be the most suitable agent for the rapid counter-action of gastric acidity. At the same time, experimenters made the suggestion that tribasic calcium phosphate, citrates, and calcium carbonate are almost equally effective. The manufacturers of calsoma, it would appear, have produced a preparation very closely following these suggestions. The effervescent powder is granular, is put up in two-ounce bottles, and for a single dose two teaspoonfuls are added to a glass of cold water and is taken after meals at the period which personal experience shows to synchronise with the onset of heartburn. For children under 10 years of age one teaspoonful is indicated. There is clinical evidence that in gastric ulcer the drug may be safely used over long periods.

Trinitrine Caffėinėe (Dubois).—This preparation has been sent to us by the Anglo-French Drug Co., 238A, Gray's Inn-road, London, W.C. In its new pharmaceutical form the drug is supplied in sugar-coated, soft-centred pills from which, when placed in the mouth and chewed the nitroglycerine is immediately liberated and absorbed, prompt action resulting. Each pill contains in addition to 3 cg. of trinitrin (1 per cent. sol.) 2 cg. of pure caffein, which is found to prolong the action of the trinitrin, while intended to counteract the weakness following on anginal attacks. The directions warn the consumer that the maximum dose in the 24 hours should be ten pills.

Hepatex is a concentrated extract of liver produced in the laboratories of Messrs. Evans Sons, Lescher and Webb, at Froston Lodge, Runcorn, in accordance with a method evolved by their own research workers. The liquid is so concentrated that 1 oz. contains the active principles of 16 oz. of fresh liver, and it can be taken undiluted in teaspoonful doses or in soup and similar vehicles. Hepatex is supplied in four-ounce bottles, which is sufficient for eight days' full treatment.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, Sept. 18th.—3.15 P.M., Dr. R. Wade: Anæsthesia.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.1:
MONDAY, Sept. 17th.—1.30 P.M.: Examination of the Ear.
WEDNESDAY, Sept. 19th.—1.30 P.M.: Examination of the Nose.

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[1] THE LANCET, 1928, i., 1236.

Lettsomian Lectures
ON
RHEUMATIC HEART DISEASE IN CHILDHOOD.

Delivered before the Medical Society of London

BY F. JOHN POYNTON, M.D., F.R.C.P. LOND.,
PHYSICIAN TO THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET; PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL.

LECTURE II.*

Delivered on Feb. 28th, 1928.

IN this lecture I shall discuss the advantage that I believe would result from basing the study of heart disease as far as possible upon its development in the young, and building upon this foundation the further manifestations of heart disease in the adult. This should be of particular value in the study of the infective diseases of the heart. We should teach first the earliest signs of cardiac disorder, those which occur at an age when the heart is at its greatest perfection, rather than the later and complex signs which distinguish a heart scarred by past disease r degenerated by alcohol or damage to the coronary essels. We should dwell upon the efforts made by he young heart to recover from an acute infection, and upon our knowledge of the factors that tend to prevent further infection and damage rather than upon minute differences in the action of cardiac tonics and their effects on a worn-out heart. We should indicate first of all how to prolong the life of the heart by prevention and anticipation, and thus create around the subject an atmosphere of hope rather than one of that melancholy which must surround our feeble efforts at combating chronic morbus cordis.

The physician with wide experience of the symptoms of heart disease in the young can best appreciate hose peculiar to the adult. In the rheumatic form f childhood all or any parts of the heart may be ttacked, and its study demands accurate clinical bservation, great patience, and watchful care in treatment, with a mind quick to appreciate and apply advances in knowledge, both therapeutic and strictly scientific.

It may be of service to put forward some features that have attracted my attention, for comparison with the experience of others, and to mention some of the landmarks which have seemed to me of value.

AGE OF ONSET.

The early age at which rheumatic heart disease may appear is remarkable and of vital importance. There are a few records of women suffering from acute rheumatism in pregnancy and of the detection of a murmur in the fœtus in utero. When I was pathologist at St. Mary's Hospital I made a post-mortem examination upon a two-days-old infant whose mother had suffered from rheumatic fever in pregnancy. The child was very cyanosed and the post-mortem examination showed large vegetations upon the mitral valve, spreading to the aortic and containing masses of streptococci. This case was the one which urged me to investigate the cause of acute rheumatism, and it is somewhat ironical that Paine and I spent our first two years in searching or Achalme's bacillus and discarding streptococci! have seen chorea with acute cardiac dilatation t 10 months, and a child with chorea and mitral isease at 2½ years, followed by rheumatic relapses nd definite mitral stenosis by the fourth year. These early cases are most instructive, on account of their clinical course and histories and because it is at this early age that we are likely to meet with considerable difficulties in diagnosis.

The highest incidence of rheumatic heart disease is, I believe, around the tenth year, and my statistics, based on over 1000 first attacks and compiled over 30 years, support this statement. My impression is that acute rheumatism is more frequent before the fifth year than is generally recognised, for in 1908 I had no great difficulty in collecting 52 cases, all under personal observation. Forty-three of them had organic heart disease, eight were fatal, and five were complete invalids. A review of the last 100 cases of acute rheumatism admitted to my ward at the Hospital for Sick Children, Great Ormond-street, showed that 13 had the first attack of rheumatism between two and five years. One died at 4 years and 11 months of carditis; six had organic valvular disease; four had repeated attacks of chorea and valvular disease; one had chorea; and one arthritis.

The following are five examples of early rheumatic heart disease.

1. A female, aged $4^{10}/_{12}$, 14 days before admission to hospital had a sore-throat followed by multiple arthritis, and then by carditis, which proved fatal.

2. A male, aged 4 years, living in a damp house, was brought to the hospital for chorea. He was found to have mitral endocarditis with an enlarged heart.

3. A female, aged 2¾, had for seven days suffered from a "cold." This was followed by chorea, mitral endocarditis, and cardiac dilatation. There were recurrences of rheumatism, and at 4 years she had obvious mitral stenosis.

4. A female, aged 4¼, living in a damp house, had been ailing for six months. There were wasting, anæmia, nocturnal pains in the joints, and later, arthritis. On examination there was great cardiac dilatation with mitral endocarditis. The cardiac lesion had been unsuspected.

5. A female, aged 14½, three months before admission had become pale and progressively more feeble without any definite symptoms, then followed a slight chorea, then carditis with venous thrombosis, pericarditis, broncho-pneumonia, and death.

MODES OF ONSET OF RHEUMATIC HEART DISEASE.

This question is one which must necessarily be closely associated with the problem of deciding what is to be considered reliable evidence of heart disease. There will always, I imagine, be cases that elude us, and in the absence of arthritis and chorea we must expect parents sometimes to fail in recognising that their children are ill. A great number of cases of rheumatic heart disease in childhood fall into one of two groups, the first beginning with a sore-throat, arthritis, and muscular pains, the second with chorea. Then comes a smaller group in which there is a severe and dangerous attack of acute rheumatism with carditis and many manifestations. We are then left with a group which may be called primary cardiac rheumatism. This is not a clear-cut division, for though rheumatism may undoubtedly attack the heart predominantly and without any other noticeable collateral sign of infection, closer investigation often reveals a sore-throat, some suspicious pains, or even a passing arthritis so evanescent as to be neglected. Or the child may have had a considerable period of poor health, losing weight and strength, and becomin anæmic and short of breath, nervous and irritable it may be feverish or troubled by night terrors o attacks of acetonæmia. Within this group is a smal subgroup of cases in which the onset commence with a startling disturbance of rhythm—e.g., a heart-block or auricular flutter.

First Signs of Heart Disease.

In the rheumatic child acute dilatation is the earliest evidence, and I am a strong supporter of the great value of percussion. When the late Dr. D. B. Lees was studying dilatation of the heart I traced out many cardiac outlines in normal and cardiac children, and in fatal cases tested their accuracy by needles driven into the chest at intervals along the line of tracing. I am convinced that in childhood the deep cardiac dullness can be accurately ascertained, but I do not say—and this I emphasise—that this holds good in the adult. The peculiarly light form of percussion needed requires careful

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* Lecture I. appeared in THE LANCET of Sept. 15th.

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practice, and I have repeatedly been able to convince students how accurate percussion can be once they have realised the method. It is difficult to imagine a more essential undertaking in the whole field of clinical cardiology. An early rheumatic dilatation in childhood may precede endocarditis and pericarditis, and may occur irrespective of either. The complete picture is well known: the quickened pulse, the feeble impulse, the outline enlarged to the right, the left, and sometimes upwards, the short first sound with sometimes a soft systolic bruit internal to the apex, and an accentuated pulmonary second sound. If we do not accept the value of dilatation we are driven for our first evidence to the signs of endocarditis or pericarditis, and thus overlook one of the cardinal principles in heart disease; that first thoughts should be directed to the myocardium. This view of the value of percussion is disputed, and I agree with Dr. John Parkinson that the most satisfactory proof of an early heart involvement is the demonstration by electrocardiogram of such an event as heart-block. I hold, however, that the most useful information is most often gained from demonstration of dilatation by percussion.

The usual type of dilatation is acute, but on very rare occasions it may be fulminating. Those who have seen this clinical landmark of heart disease—an acute asystole as the result of a fatal primary rheumatic dilatation—can never forget the ashen pallor, the vomiting and horrible restlessness, the running pulse and embryonic heart sounds, the rapidly enlarging liver, and the pulmonary œdema without any general dropsy, save a little puffiness round the ankles and possibly of the face.

Another more frequent type of dilatation, with an nteresting bearing upon adult heart affections, is the subacute and chronic type usually associated in childhood, as in adult life, with much nervous disturbance. The dilatation does not subside and the heart remains large and feeble for a long time. As a rule a triad of symptoms develops, due respectively to the heart, the nervous system, and the digestive system. As a result the children are breathless on exertion, and may have fainting attacks and cardiac pain. They have a rapid and sometimes irregular pulse, the rate of which is influenced so greatly by emotion that we are often doubtful how to divorce the nervous from the cardiac element. The heart beat may be forcible but is ineffective. They suffer from flatulence and dyspepsia, which further complicate the condition. They improve with rest and care but rapidly become fatigued by over-exertion, and quickly relapse if it is continued. In some of these cases one suspects either an element of hyperthyroidism or else that the child has had from birth a constitutional weakness of the myocardium, which may be soft, fat, and flabby. An important point is the absence of valvular damage, so that if the dilatation is overlooked the child's condition may be considered entirely due to "nerves," and if he is old enough to go to a boarding-school he is likely to receive scant sympathy from the "muscular Christian" order of schoolmaster.

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My view, founded on observation, that acute rheumatism may produce in childhood the condition of "irritable heart," is strengthened by my experience of "D.A.H." among soldiers, and receives interesting and valuable support from an unpublished investigation carried out by my friend, Dr. John Parkinson, when on active service. He analysed with much care the histories of 3000 soldiers suffering from medical illnesses. In the first 1000 he found 172 men who had suffered from a definite attack of acute rheumatism without valvular disease earlier in life, and in this 1000 20 per cent. of the total of 630 cases of D.A.H. were found in the rheumatic group. In the second 1000 170 gave the same history of previous acute rheumatism, and 20·5 per cent. of the 610 cases of D.A.H. fell in this group. In the third 1000 148 gave a similar history, and 17·4 per cent. of the 664 cases of D.A.H. were in the rheumatic group. Thus an investigation concerned only with adults reached the same conclusion, that acute rheumatism without endocarditis is one of the most important agencies in the history of the "irritable" heart.

DISTURBANCES OF RHYTHM.

The disturbances are probably the result of focal lesions in the connective tissue framework of the heart in the region of the bundle of His. The technical skill and necessary equipment for their study cannot be expected of physicians in general, and the exact significance of the electrocardiographic tracings is, in some cases, difficult to assess. A considerable bibliography has sprung up, and among the various papers those of J. Parkinson, Hope Gosse, and E. B. Gunson, in 1920, and A. E. Cohn and Homer Swift in 1924, are particularly helpful.

Sinus Arrhythmia.—The English writers remark that the presence of sinus arrhythmia does not signify that the heart has escaped infection, and with this my clinical experience is entirely in accord. They give a tracing that shows the combination of heart-block with sinus arrhythmia, and heart-block in acute rheumatism is evidence of myocardial damage.

Heart-block may vary from a mere prolongation of the P.R. interval to a complete block. H. G. Butterfield, in the volume of Heart for 1911–12, published a case which has always appealed to me. This was a girl, aged 16, who showed a partial heart-block for the last 11 days of her life while suffering from acute rheumatic carditis. After death a minute diplo-streptococcus was isolated from the pericardial exudation and inflamed valves. Aschoff's nodules were demonstrated in the myocardium, and a widely diffused inflammatory exudate, most intense in the region of the auriculo-ventricular node, was discovered. Naish and Kennedy [1] published a case of a boy of 16 suffering from carditis; similar changes were found in the auriculo-ventricular node. They also directed attention to the sudden onset of arrhythmia in a boy of 8. There could be no more striking example of complete heart-block, ushering in a very severe first attack of acute rheumatic carditis, than the case I published in the Archives of Disease in Childhood for February, 1927.

A boy of 13 developed a sore-throat and, four days later pain in the chest, fainting attacks, and vomiting. When I saw him there was obvious heart-block, the ventricles beating at 36, the auricles at 72, per minute. After about a week the block vanished, to be followed by arthritis, most severe chorea, and endocarditis of the aortic and mitral valves.

Several features in this case confirmed the observations of others—e.g., the transient block, in spite of the very severe carditis which followed; fever which was doubtless, in part, due to the sore-throat, and the early syncopal attacks which occurred before I saw the boy but which may reasonably be interpreted as of the Stokes-Adams type. Such cases are rare. A simple transient bradycardia may also occur in rheumatic carditis.

Auricular flutter may occur in childhood quite apart from rheumatism, and may even be congenital. In infancy the symptoms are remarkable—screaming, cyanosis, vomiting, drawing up of the legs, breathlessness and rigidity, cardiac dilatation, and sometimes acute failure. I have followed a case for years, but I have never met with such severe symptoms in acute carditis. Flutter must, I suppose, point to myocardial damage, though this may be quite transient and the flutter be a matter of seconds. When four months old this patient was nearly moribund from heart failure and had numberless attacks afterwards, yet now, at the age of 5, is well grown and much less liable to attacks.

Paroxysmal tachycardia may follow an attack of carditis.

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[1] THE LANCET, 1914, ii., 1242.

Premature contractions are more commonly auricular than ventricular. Parkinson, Hope Gosse, and Gunson, pointing out the association of auricular premature contractions with flutter and heart-block, incline to the view that they are evidence of definite myocardial damage. Ventricular premature contractions are not so suggestive. There may be very considerable difficulty in distinguishing between premature auricular contractions and auricular fibrillation without electrocardiographic tracings.

Auricular fibrillation is a recognised feature in chronic rheumatic heart disease, and I saw a remarkable example in a boy of 12 who had an apparently well-compensated mitral stenosis. One day, in a hot sun, he bicycled many miles up and down hills and came home utterly exhausted and developed severe fibrillation. Sutherland has reported a case where it occurred in the acute stage of an early carditis, but I believe this to be very rare.

My conception of rheumatic disease of the myocardium is that in the acute carditis of childhood the general myocardial poisoning is the outstanding lesion in the production of clinical symptoms, and that, in comparison, the interstitial focal lesions are comparatively insignificant.

VALVULAR DISEASE.

The bead-like vegetations of early endocarditis, producing slight incompetence, could not in themselves cause any degree of dilatation, and the presence of actual valve deformity can only be ascertained by the constancy of a systolic murmur, which usually disappears with the dilatation. Later, if the mitral endocarditis is at all severe, the signs of hypertrophy will decide the point. There was at one time an idea that a systolic mitral murmur in a rheumatic child was of little importance. This is true enough from the mechanical aspect, both in adults and in the young, when the heart is stabilised, and the view was, I think, the result of a reaction against the vexatious and useless prohibition of exercise and ordinary activity. Nevertheless, in the rheumatic child, this murmur is an evidence of cardiac rheumatism and to this extent important, and we must certainly guard against any idea that mitral incompetence in childhood may not be most serious. In fact, such cases, when there has also been myocarditis, may run a disastrous course and never properly compensate. It may be the murmur that attracts our attention, but it is the condition of the myocardium that governs the situation. A well-known occurrence is the increase of intensity of a mitral systolic murmur when a child is once more renewing activity, and this may be brought forward as evidence of a mistake in treatment. On the contrary, however, provided the child is well and the impulse *firm and stable, it is a good sign. After* some years this murmur, even though loud and heard clearly toward the axilla, may gradually become

for shortness of breath, and I then found an advanced mitral stenosis.

Could any result be more disappointing? Yet I am not convinced that we had learnt all we might about the case, for at present the organisation for special convalescent hospitals is hardly perfect. These should be centres for clinical research as well as for supervision.

Tachycardia is sometimes transient and sometimes more or less continuous. I have noticed this symptom appear at the very onset of the cardiac disease, even before any mitral stenosis could have developed. The most conclusive of all my cases was the following.

A girl, aged 9, living in a damp house, which was liable to flooding, had been ill for four months. She had become very nervous, suffered from severe headaches, and finally developed chorea, for which I saw her in March, 1902. There was dilatation of the heart and a pulse varying between 120 and 150 per minute; the thyroid seemed a little enlarged. She was in hospital six months and never had signs of pericarditis or endocarditis, in spite of the persistent tachycardia. Many of her teeth were carious and were removed, after which the tachycardia quieted down. The explanation that it was the result of a chronic sepsis from dental suppuration was generally accepted. She remained in hospital four months after the dental extractions, leaving in June. In July she returned with severe tachycardia and great nervousness, but there was no pericarditis or obvious endocarditis, renal disease, or tuberculosis. In June, 1903, the house was flooded and she developed rheumatic pains and tachycardia. In August chorea developed again, but there was no cardiac murmur. In 1904 she had another attack of chorea, and now there were signs of mitral stenosis with tachycardia. In 1905 a further attack of chorea occurred, with tachycardia, and there was further evidence of mitral stenosis. I saw her for the last time in June, 1910; she was then aged 17, and in domestic service, with an enlarged heart and every sign of mitral stenosis. Upon any excitement the pulse-rate rose to 150 per minute.

Cases such as these lead me to dwell repeatedly upon the nervous element in the cardiac disease of rheumatic children, and they teach a lesson which I think is of value in the study of heart disease in adult life.

Lastly, even in childhood, malignant endocarditis may supervene upon a mitral stenosis, although I believe this to be rare.

The rare cases of congenital mitral stenosis show changes in the valve that point to a reaction to infection rather than malformation, and I believe that most of the mysterious cases of mitral *stenosis* are the results of a primary cardiac rheumatism. How insidious and unexpected such cases may be is exemplified by a boy, aged 5, who came under my observation for a mysterious nephritis with blood and casts in the urine. This condition lasted many weeks with only the slightest rise in temperature; during that time warning signs of mitral stenosis developed, but there was no other rheumatic manifestation. The renal condition eventually recovered, but two months later definite chorea appeared [illegible] practice, and I have repeatedly been able to convince students how accurate percussion can be once they have realised the method. It is difficult to imagine a more essential undertaking in the whole field of clinical cardiology. An early rheumatic dilatation in childhood may precede endocarditis and pericarditis, and may occur irrespective of either. The complete picture is well known: the quickened pulse, the feeble impulse, the outline enlarged to the right, the left, and sometimes upwards, the short first sound with sometimes a soft systolic bruit internal to the apex, and an accentuated pulmonary second sound. If we do not accept the value of dilatation we are driven for our first evidence to the signs of endocarditis or pericarditis, and thus overlook one of the cardinal principles in heart disease; that first thoughts should be directed to the myocardium. This view of the value of percussion is disputed, and I agree with Dr. John Parkinson that the most satisfactory proof of an early heart involvement is the demonstration by electrocardiogram of such an event as heart-block. I hold, however, that the most useful information is most often gained from demonstration of dilatation by percussion.

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may arise in differentiating some cases of aplastic anæmia and acute leukæmia from acute rheumatism. In all three there may be sore-throats and obscure pains in the limbs. The cardiac signs also may be most puzzling, for in the primary anæmias a loud systolic mitral murmur may be audible, and when they are extremely severe a basal diastolic murmur may be detected. The pulse is rapid, and the first sound at the impulse so abrupt as to simulate very closely the lesion of mitral stenosis. In all three here may be fever, breathlessness, purpura, and some enlargement of the spleen. If the leukæmia shows a leucopenia, the differential count requires considerable skill, and the blood of an aplastic anæmia also requires skilled investigation. I have seen remarkable examples of the difficulty in the diagnosis of these cases, particularly when the original one of rheumatism has been made in error. The anæmia is generally more predominant in the blood disease than in rheumatism, and the so-called "rheumatic symptoms" usually resolve themselves merely into vague pains.

It is interesting to observe, when one of the curious remissions occurs in a primary anæmia, that almost all the cardiac signs also disappear, to recur with the relapse. This has no parallel in rheumatism.

THE THYROID.

It is possible that the thyroid gland may play a greater part in the disturbances of the heart in rheumatism than we realise. In this country Llewellyn Jones Llewellyn has for many years insisted upon its importance in rheumatic affections, and French writers have alluded to rheumatic thyroiditis in adolescents. I have recently seen four examples of thyroid enlargement with tachycardia, tremor, and acute rheumatic morbus cordis, though in none was there apparently any thyroiditis. The problem is difficult, for it is exceptional to find any obvious enlargement of the thyroid in children suffering from acute rheumatism, and so we are driven at present to the assumption that damage, if it is frequent, must be due to an increase or alteration in the secretion without any perceptible change in the size of the gland. Sometimes, but very exceptionally, I have noticed swelling of this gland in chorea, and in our ignorance of the nature of the rheumatic poisons and our knowledge of the remarkable nervousness of the rheumatic child we have reasons for investigating this subject further.

SUMMARY.

It is clear that endocarditis in all its phases can be studied in the child, but in the adult we are usually concerned less with the development of endocarditis than with the results it has produced by scarring. In the child we learn in detail the history of pericarditis, and, though rheumatic pericarditis may occur in a patient over 70, opportunities for a complete study in adult life are far fewer. We learn also from the first the importance of the myocardium, and in the child we get striking illustrations of the symptoms that result from its general damage. We see how the "weak heart" may arise, and how, in the adult, this may give way under stress and strain. We are led to appreciate the nervous element, which is of such importance in the history of heart disease at all ages, and to realise how early in life this element may assert itself. The remarkable vitality and recuperative power of the child's heart impresses upon us the necessity for studying the factors which in adult life sap this vitality. There is the natural decline of cardiac power with the arrival of old age, but there are also the acquired factors, such as atheroma of the coronary vessels, high tension, or he damage done by poisons such as alcohol. Realising he freedom of the child's heart from these dangers, and guided by our knowledge of juvenile rheumatic heart disease, we are more easily able to appreciate such differences in the behaviour of these damaged adult hearts as the appearance of angina pectoris, the sudden disaster of a coronary thrombosis, or the defeat of a heart in the long battle against the strain of hypertension. We can see more closely the essential difference between the rheumatic child who breaks down from the renewed attacks of the active disease and the adult who, surviving an early rheumatism, breaks down from the gross deformities of the valves which have been left as its legacy.

We can also appreciate more fully the differing character of the lesions and symptoms that occur when an infection of another type peculiar to adult life—the acquired infection of syphilis—attacks the heart and blood-vessels.

We bring with us the same mental attitude to adult heart disease that we do to the heart disease of the child, and are led instinctively to search for the early warnings and early events that lead to its development.

We find our most promising fields for the study of mitral stenosis, and probably of malignant endocarditis, in the young. We can also learn the best methods for the prevention and amelioration of morbus cordis.

Finally, a problem in the study of heart disease in childhood which may eventually need careful thought is this: how will arrangements be made for the student of the future to obtain a general view of acute rheumatism in its true perspective if, as seems possible, he is to be educated by an orthopædic specialist in rheumatic arthritis, by a neurologist in chorea, by a children's specialist in acute rheumatic heart disease, and by a cardiac specialist in chronic heart disease? What will he eventually know of the general disease "acute rheumatism"—the chief cause of morbus cordis in this country? Should we not remember, before it is too late, words of that great genius, Roger Bacon, "As with an eye torn out, or a foot cut off, so it is with the different departments of wisdom; none can attain its proper result separately, since all are parts of one and the same complete wisdom"? Realising that this was the central theme of his *opus magnus* and the guiding star of that mighty intellect, should we not pause and think?

THE REGULATION OF RESPIRATION.

A SUMMARY OF RECENT EXPERIMENTS.*

BY ROBERT GESELL, M.D.,
PROFESSOR OF PHYSIOLOGY, UNIVERSITY OF MICHIGAN.

SEVERAL years ago, as a result of experiments on the effects of hæmorrhage and reinjection on pulmonary ventilation, I called attention to serious exceptions to the prevailing theories of respiratory control. For example, a systematic review of the relation of blood acidity to pulmonary ventilation revealed a more frequent inverse than a direct relation of pulmonary ventilation to the hydrogen-ion concentration of the blood. The common inverse relation of pulmonary ventilation to alveolar and arterial carbon dioxide pressure served as an exception to a primary control by changes in the arterial and alveolar carbon dioxide. Increased pulmonary ventilation associated with either low or excessively high alveolar oxygen pressure was an exception to the theory of the direct effect of oxygen on respiratory activity.

Our informaton on the chemistry of the blood, on the aerobic and anaerobic acid metabolism of the cell, and on the behaviour of the cell membrane to the movement of acid and base, hardly warranted the assumption of parallel changes in acidity within and without the metabolizing cell. The probabilities rather favoured a frequent occurrence of opposite changes in acidity within the cells and in the blood, and appeared to offer an opportunity of formulating an all-inclusive theory of respiratory control, avoiding the exceptions to the prevailing theories. In brief, a direct relation was assumed between the acidity of the respiratory centre itself and pulmonary ventilation.

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* An address delivered at the opening of the university clinics and new medical laboratories at the University of Chicago.

a slight rise of temperature may rouse suspicion. The weakening of the second sound in the aortic area, with the development of a soft systolic murmur and then of a soft diastolic murmur to the left of the sternum are well recognised, but cannot be over-emphasised, for this lesion is more often overlooked than any. These cases develop along two lines; either the mitral or the aortic lesion becomes predominant, and before childhood is past we may recognise clearly that the patient is doomed to suffer from aortic disease. In severe cases of carditis, extreme damage may occur in a few weeks, and within a fortnight the pulse may have already acquired the Corrigan features. The pulse may even disappear when the arm is raised, and sudden death can occur before the age of 12. On the other hand, I believe that some aortic lesions are so slight as to be recoverable. I am led to this from clinical observation, and from examples in the post-mortem room of slight thickening of the cusps where no aortic lesion had been detected. No children are more nervous than the rheumatic ones with aortic lesions of any severity, and, even though the heart has apparently compensated, this nervousness and inability to stand school-strain is a striking feature.

MALIGNANT ENDOCARDITIS.

In my first lecture I dwelt upon the tendency for cases of aortic and mitral disease to develop malignant endocarditis in later life; this may also occur in childhood after what appears to be a severe recurrent attack of acute rheumatism.

A boy, aged 16, suffered from acute rheumatism with carditis at the age of 6, and after that had three more definite attacks. His mother had suffered from rheumatic fever. Three weeks before admission to hospital he had pains in the ankles and knees and round the heart, and his mother thought that it was another attack of rheumatism. He was anæmic and wasted, and there was irregular pyrexia, with signs of aortic and mitral disease and infarctions in the spleen and kidneys. After death none of the vegetations seen on the valves exceeded the size of a pea, but the sections showed masses of streptococci.

This was the type of case which interested Litten in 1899 and led him to believe that rheumatism was becoming more septic in type.

I think we are most likely to throw further light upon this form of endocarditis by studying its development in children and adolescents who are known to have rheumatic heart disease. I hope that in the future many valuable records of rheumatic cases of morbus cordis, supervised over years, will be published, and that an increasing volume of evidence upon the onset of the malignant type will be forthcoming. Shall we find then that the circumstances of the onset were indistinguishable from those of a rheumatic attack, or will there almost invariably be clear evidence of some new type of infective illness grafted on the rheumatism, or proof that the new infection occurs in cases in which we have never felt satisfied that the rheumatism has ceased to be active? Experience shows that in many adult cases we have no guide at all to the causation of malignant endocarditis, but continuous records of the histories of rheumatic heart affections may eventually enable us to decide upon the cause or causes for the break in the history which produces this condition. It is necessary in such an inquiry to dismiss entirely from our minds any classification of malignant endocarditis based on its duration, and to be prepared to find fulminating, subacute, and chronic cases all developing in the rheumatic heart.

Here again you will recognise that the study of heart disease in the young makes a sound basis for the study of heart disease in general.

A certain degree of aortic stenosis is not infrequent in combined aortic and mitral disease, and if it develops later in childhood and adolescence it may relieve the heart of some of its difficulties, but a predominant aortic stenosis appears to me to be very rare, though I have for some years been watching a boy who suffers from an extreme degree of stenosis.

Pericarditis.—The consideration of pericarditis as an entity apart from endo- and myocarditis greatly hampers the education of the student. It is easy to grasp the idea of an inflamed serous membrane pouring out fluid, which gradually subsides, leaving the pericardium adherent, but this does not represent rheumatic pericarditis. In childhood there is rarely much fluid poured out, and the wide area of cardiac dullness is mainly the result of dilatation due to myocardial weakness. There may be no fluid, but much thickening of the pericardium, and the main danger of pericarditis is the concurrent myocardial weakness. In fact, it is impossible to consider rheumatic pericarditis apart from the other factors in a carditis. Virulent carditis with pericarditis may be afebrile. Acute dilatation and an excited and rapid action of the heart may precede the appearance of pericardial friction by several days, and even by a week or more. There may be no distress, and in some cases the discovery of the lesion comes as a complete surprise. There are cases in which it does far less damage than a severe myocarditis, so that its occurrence, though always serious, is not necessarily alarming.

Recovery, in the sense that the child may be able to leave hospital, can occur under five years even when there are very severe general carditis, chorea, profound anæmia, numerous nodules, and severe polyarthritis. Extensive pleurisy and mediastinitis are very grave complications, leading as they do to the worst type of adherent pericardium. The occurrence of pericarditis without endocarditis suggests some infection other than rheumatic, but I believe it may result from rheumatism.

Lastly, in some cases we may see the wave-like character of the rheumatic infection: an outburst, then a remission, then another outburst and remission, in some cases prolonged over months.

Venous thrombosis is an interesting complication in the severe carditis of childhood; I have seen eight examples. Seven of these implicated the large veins of the head and neck, two including the superior vena cava. At one time I thought these thromboses might have been mechanical, for they had all been associated with severe carditis, and it seemed reasonable to suppose that pericardial adhesions might have been a factor. In the eighth case the occurrence of thrombosis at the lower end of the inferior vena cava in a boy suffering from severe chorea and an endocarditis from which he made a good recovery, negatived the mechanical explanation. A. F. Voelcker's case of chorea and thrombosis without any cardiac lesion is still more conclusive. The condition is probably an acute phlebitis of rheumatic origin. As a rule the first noticeable sign is an œdema of one arm and then, if it is extensive, of the chest and face; there may be pain, tenderness, and resistance along the veins. In one of the fatal cases the superior vena cava and all the tributaries were occluded, and there was a pulmonary embolism, due to soft clot being detached from the lower end of the thrombus in the superior vena cava. I have never seen venous thrombosis in any other form of heart disease in childhood, but there can be no doubt of its occurrence and reality in rheumatic carditis.

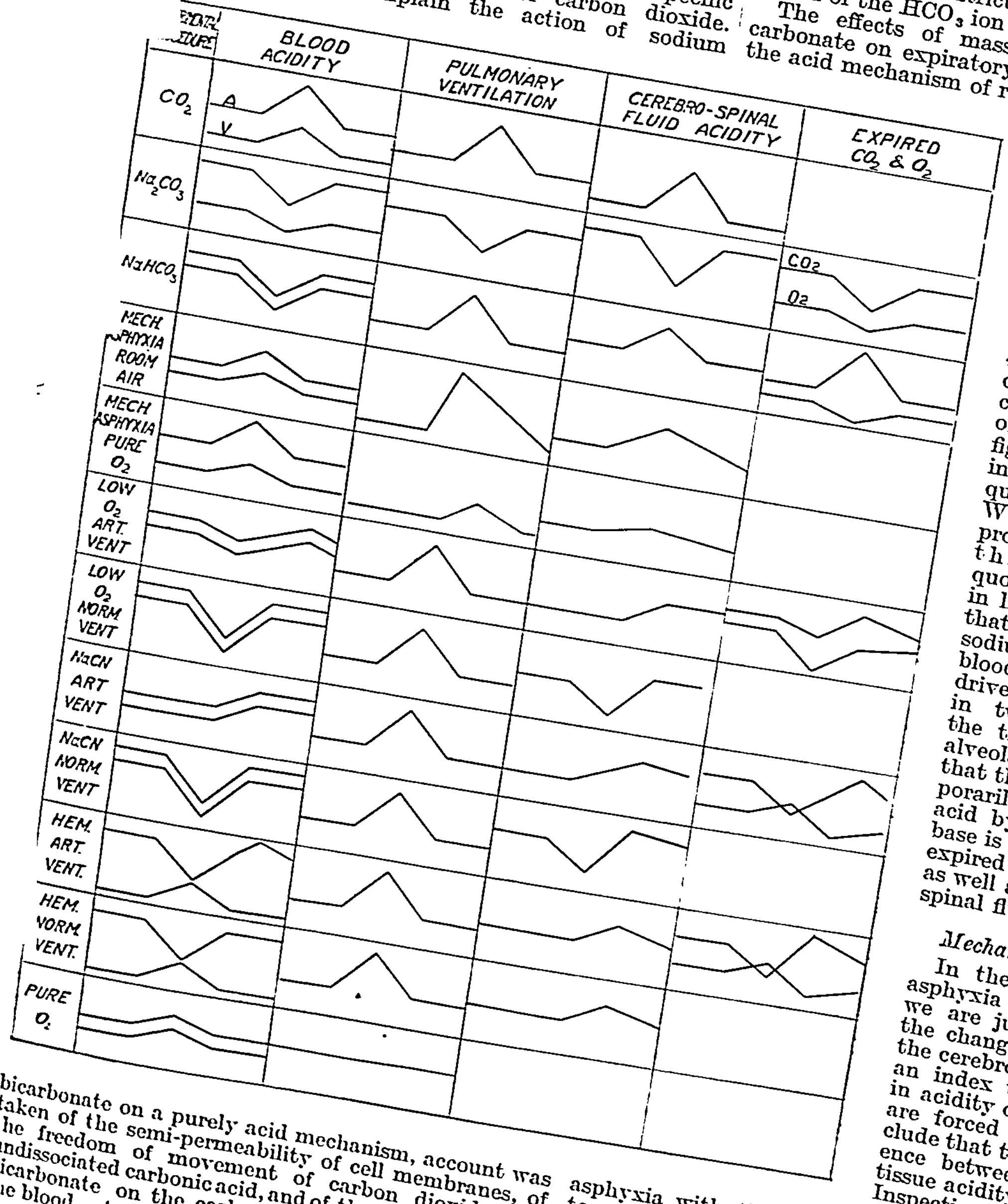
Gangrene of the extremities I have met with in the severe mitral stenosis of young children. Gangrene may also occur in the malignant endocarditis of rheumatic children from arterial occlusion; in one such case, complicated by a femoral aneurysm, the entire limb became gangrenous before death.

Except for a slight degree of *aortitis*, seen after death in a few cases, I have not met with a severe inflammation of the arteries in acute rheumatism (or, if it occurred, I have failed to recognise it), and I have never seen extensive implication of the arteries in any post-mortem examination on a rheumatic child. Vaso-motor spasm is sometimes a sequela of acute rheumatism and causes cyanosis of a limb or a Raynaud-like affection of the fingers and hands.

The striking *anæmia* produced by virulent rheumatism is thoroughly recognised, and difficulties primarily as a result of increased diffusion of carbon dioxide. On this point the experiments on sodium bicarbonate seem more to the point, but in any event the depressed ventilation appears to be associated with decreased acidity of the tissues.

The stimulating effects of intravenous injection of odium bicarbonate constituted one of the major ifficulties in arriving at a satisfactory theory of espiratory control, and led to theories of the specific ction of the HCO_3 ion and of carbon dioxide. attempting to explain the action of sodium bicarbonate on a purely acid mechanism, account was taken of the semi-permeability of cell membranes, of the freedom of movement of carbon dioxide and undissociated carbonic acid, and of the effects of sodium bicarbonate on the carbon dioxide buffer system of the blood. Assuming first that the addition of sodium bicarbonate affects the equilibrium of the buffer system with an increase in the freely diffusible carbon dioxide and carbonic acid, a back pressure of carbon dioxide is immediately established, retarding the normal movement of acid from tissue to blood. Increasing tissue acidity should result, granting that the semi-permeability of the cell membranes acts as sufficient barrier to the increased metallic kations. It is obviously extremely difficult to perform the direct experiment of following changes in acidity of a neurone of the respiratory centre with injection of sodium bicarbonate, but inasmuch as the cerebro-spinal fluid is separated from the blood by membranes which appear to possess selective action, it seemed worth while to determine the effects of intravenous injection of sodium bicarbonate on the acidity of the fluid. Increased acidity was found to occur. If we may infer that similar changes in acidity occurred within the brain cells, the respiratory response may be explainable on a strictly acid basis and the specific action of the HCO_3 ion abandoned.

The effects of massive injection of sodium bicarbonate on expiratory gases support the theory of the acid mechanism of respiratory control. It will be seen, for example, that t carbon dioxide eliminati is enormously increase Oxidations are also i creased but not in propo tion to the carbon dioxid elimination. In one experi ment the expired carbon dioxide was increased from 4·34 per cent. to 9·10 per cent., a total increase of 4·76 per cent. The associated increase in oxygen consumption amounted to only 1·6 per cent. These figures correspond to an increase in the expiratory quotient from 0·91 to 1·42. While several factors probably contribute to this high expiratory quotient, the results are in line with the postulate that the addition of sodium bicarbonate to the blood may momentarily drive the carbon dioxide in two directions—into the tissues and into the alveolar air. The view that the tissues may temporarily be turned more acid by the injection of base is thus upheld by the expired gas experiments as well as by the cerebro-spinal fluid experiments.



Mechanical Asphyxia.

In the mechanical asphyxia experiments, if we are justified in using the changes in acidity of the cerebro-spinal fluid as an index to the changes in acidity of the brain, we are forced again to conclude that the correspondence between blood and tissue acidity is uncertain. Inspection of the chart shows that mechanical asphyxia with the lungs filled with room air leads to a greater increase in acidity of the cerebro-spinal fluid than asphyxia with the lungs filled with oxygen, though the increase in acidity of the blood is considerably less. These acid-base relations in tissue and blood are presumably explainable by changes in acid metabolism at the cells, and in disturbances in the transport and elimination of carbon dioxide due to a broken coördination of the dual function of hæmoglobin. The increased acidity of the cerebro-spinal fluid is probably a result of impaired oxidations and impaired transport of acid, with a resultant diffusion of fixed and free acid into the fluid. The smaller increase in acidity of the arterial blood with the lungs filled with room air is traceable to the alkaline effect of liberation of free base, which goes hand in hand with progressive reduction of oxyhæmoglobin. A highly reduced blood, heavily laden with acid, incapable of the normal liberation of oxygen and base at the

With the use of various continuous methods, acute respiratory disturbances produced by administration of carbon dioxide, sodium carbonate, sodium bicarbonate, mechanical asphyxia, low and high alveolar oxygen, sodium cyanide, and hæmorrhage and reinjection were followed and analysed with respect to the acid base equilibrium of the tissues and body fluids.

The accompanying figure shows in a very schematic way the more outstanding results of our experiments. The first column tabulates the types of procedure, the second indicates the changes in acidity of the circulating arterial and venous blood, the third correlates the associated changes in pulmonary ventilation. The following column gives the changes in acidity of the cerebro-spinal fluid. the next shows the changes in expired carbon dioxide and oxygen using constant artificial ventilation, and the last column shows changes in carotid and femoral flow of blood.

An analysis of the second and third columns, showing changes in acidity of the arterial and venous blood and changes in pulmonary ventilation, will give a notion of the relation of pulmonary ventilation to blood acidity. The administration of carbon dioxide turns both the arterial and venous blood more acid, and pulmonary ventilation increases. Readministration of room air is accompanied by decreased acidity and a return to normal ventilation. Intravenous injection of sodium carbonate turns both the arterial and venous blood more alkaline, and pulmonary ventilation subsides. With recovery the blood swings back to normal acid values and ventilation increases. These observations fall into line with the older theory of respiratory control through the free hydrogen ions of the arterial blood, but the injection of sodium bicarbonate reveals an important exception. As the arterial and venous blood turn alkaline, pulmonary ventilation increases, and as the blood again swings, acid ventilation diminishes.

The next exception is found in the experiments on mechanical asphyxia with the lungs filled with room air, and with the lungs filled with pure oxygen. The gases were administered by artificial ventilation in volume sufficient to establish apnœa. The pump was then stopped. The changes in acidity of the arterial blood and the onset of respiratory movements were recorded. When the lungs were filled with room air, the acidity of the arterial blood increased slowly and respiratory movements came on rapidly. But when the lungs were filled with oxygen the acidity increased rapidly and the onset of increased respiratory movements was delayed. Another common exception to the theory of respiratory control by the free hydrogen ions in the arterial blood is seen in the effects of low alveolar oxygen, whether administered by artificial ventilation or by normal ventilation. In either case both the arterial and venous blood turn alkaline and ventilation is increased. On readministration of room air the blood turns acid and ventilation subsides. The intravenous injection of sodium cyanide may turn the arterial and venous blood either acid or alkaline, depending upon whether artificial ventilation is administered or whether ventilation is normally controlled. In either case respiratory movements are increased. The effects of cyanide may then be said to support and contradict the blood acidity theory of control.

Whether ventilation is artificial or normal, hæmorrhage turns the arterial blood more alkaline, at the same time increasing respiratory movements. Reinjection turns the arterial blood more acid and depresses ventilation. On the other hand, if we follow the changes in acidity of the venous blood, we find the relation between blood acidity and ventilation reversed. The increased acidity of the venous blood during hæmorrhage is associated with increased respiratory effort, and the decreased acidity following reinjection is associated with decreased respiratory effort.

To summarize, in three procedures there is a direct relation between the hydrogen-ion concentration of the arterial blood and pulmonary ventilation: the administration of carbon dioxide, sodium carbonate, or cyanide during constant artificial ventilation. In five procedures there is an inverse relation between the hydrogen-ion concentration of the arterial blood and pulmonary ventilation: intravenous injection of sodium bicarbonate, mechanical asphyxia, administration of a gaseous mixture low in oxygen, intravenous injection of cyanide during normal ventilation, and hæmorrhage. In all procedures other than hæmorrhage the directional changes in the acidity of the arterial and venous blood are the same. In hæmorrhage the directional changes are opposite. Despite the fact that the arterial blood, which flows more slowly through the lungs, is more thoroughly ventilated, both with respect to oxygenation and elimination of carbon dioxide, the highly alkalinized arterial blood, after passing through the tissues comes out more acid than normal. Obviously the slackened circulation through the tissues has resulted in greater acidification. This supports the view that acidity of the tissues may perhaps be a more important factor than acidity of the blood in the control of ventilation.

To follow up this view we may turn again to procedure number one. Though the administration of carbon dioxide turns both the arterial and venous blood more acid, the increase in acidity of the arterial blood is more abrupt and extensive than that of the venous blood. This suggests that carbon dioxide has passed from blood to tissues, so that the tissues have served as buffer to the blood. The slower return to normal acid values on the venous side on readministration of room air suggests the passage of accumulated carbon dioxide from the tissues back to the blood. The evidence is in favour of increased tissue acidity from administration of carbon dioxide. This is supported by the changes in hydrogen-ion concentration of the cerebro-spinal fluid. During the administration of carbon dioxide the fluid turns distinctly acid, and with the readministration of room air its acidity diminishes.

Effects of Sodium Carbonate.

When sodium carbonate is injected the picture is reversed. The presence of a free base capable of combining with carbon dioxide and lowering the carbon dioxide pressure in the blood leads to a greater movement of carbon dioxide from the tissues to the blood. A comparison of the acidity curves of the arterial and venous blood indicates the absorption of carbon dioxide by the blood as it passes through the tissues, for the increase in alkalinity of the arterial blood is relatively great compared with the increase in the venous blood. The decreased hydrogen-ion concentration of the cerebro-spinal fluid suggests the passage of carbon dioxide from the brain-tissue fluids into the blood.

The possibility of movement of free base from the blood into the tissue fluids should be also considered. In this respect the experiments on expired gases are helpful. Constant artificial ventilation is administered during pneumothorax; changes in expired carbon dioxide and expired oxygen indicate changes in carbon dioxide elimination and oxygen consumption. Upstroke on either record indicates an increasing content of either gas in the expired air. With a continuously administered gas, such as room air, upstroke on the carbon dioxide record indicates increasing carbon dioxide elimination, and upstroke on the oxygen record indicates decreasing oxygen consumption. Where the oxygen content of the gas is changed by administration, special analysis of the oxygen record is required to determine the changes in oxygen consumption. Inspection of the diagram of changes in expired gases on the injection of sodium carbonate during the administration of room air shows two changes, decreased elimination of carbon dioxide by the lungs and increased oxygen consumption. The coincidence of increased oxidation and decreased elimination of carbon dioxide is satisfactory evidence of the lowering of the carbon dioxide tension of the blood and accelerated movement of carbon dioxide from the tissues into the blood. It is, therefore. conceivable that the brain may have turned less acid, oxidative removal of lactic acid. It is interesting to note that the expiratory quotient may be reduced below normal during the recovery period, when carbon dioxide elimination may be considerably higher than normal. This marks a period of relative retention which soon gives way to absolute retention of carbon dioxide.

The changes in tissue acidity produced by cyanide and low oxygen are probably very similar, though the mechanism producing them is somewhat different. In each there appears to be an altered acid metabolism in favour of increased anaerobic production of acid, combined with a break in the coördination of the dual function of hæmoglobin. With cyanide administration the coördination is disturbed by a more or less permanently oxidised state of the hæmoglobin. Alkali is neither liberated in abundance at the tissues nor recalled in the lungs, for the tissues are unable to use the oxygen with which they are provided. With ow alveolar oxygen the coördination is disturbed by more or less permanently reduced state of the emoglobin. The tissues are unable to obtain the ygen which they could use.

Effects of Hæmorrhage.

Whereas the same directional change in acidity of e arterial and venous blood is the rule for most cedures, hæmorrhage is characterised by opposite anges in hydrogen-ion concentration. That this difference is attributable to the effects of volume flow of blood is clearly demonstrated by the fact that the arterial blood turns alkaline with hæmorrhage when constant artificial ventilation is administered as well as when augmented ventilation is permitted during normal control. Obviously the greater movement of air under normal conditions is not the sole contributing cause of the increased alkalinity of the arterial blood. It stands to reason that, if the degree of ventilation is a function of the amount of air to which a unit volume of blood is exposed in a unit of time, the ventilation of the blood may be increased by either augmenting the movement of air, or decreasing the flow of blood. The large increase in alkalinity of the arterial blood with constant artificial ventilation graphically illustrates the significance of volume flow of blood in the acid-base equilibrium of tissues and tissue fluids. Just as volume flow of blood through the lungs determines the alveolar and arterial carbon dioxide pressure, so does the volume flow of blood through the tissues determine the tissue and venous acid pressures. If decreased flow of blood through the lungs permits a more complete elimination of carbon dioxide per unit of blood, decreased flow of blood through the tissues must entail a greater accession of acid per unit of lood. Even granting an unmodified acid metabolism, diminished flow must lead to increased venous acid ressure with a damming-back of acid in the tissues. But adding to this the usual picture of impaired xidations with its associated disturbances in the dual nction of hæmoglobin, increased acidity of the tissues more clearly indicated. Certainly, if the arterial ood which has just been turned 0·3 to 0·4 pH more kaline as a result of hæmorrhage will leave the tissues distinctly more acid than normal, there is little room to doubt that the tissues have also turned more acid. In the expired gas experiments hæmorrhage reduced the oxygen consumption and carbon dioxide elimination, and reinjection of blood elicited typical carbon dioxide overshooting, associated with hyperconsumption of oxygen. A comparison of the curve of expired carbon dioxide and the arterial acidity curve will show the same correspondence as in the cyanide and low oxygen experiments with constant artificial ventilation. The increase in acidity of the cerebro-spinal fluid after hæmorrhage supplements the evidence for increased tissue acidity with decreased flow of blood and decreased acidity with increased flow of blood.

Conclusion.

Our experiments establish a lack of correspondence between blood acidity and pulmonary ventilation on the one hand, and indicate a correspondence between tissue acidity and pulmonary ventilation on the other hand. Granting that this relation is a causal one, we have advanced one step in the solution of the problem of respiratory control, but the exact mechanism by which acidity operates cannot be predicted until the problem of automatic discharge of rhythmically active cells is better understood. This, admittedly, is a fundamental biological problem of the widest scope. If the rhythmic discharge of the respiratory neurones is a membrane phenomenon, dependent on the structure and composition of the membrane and the nature of the fluid on each side of it, the relation between changes in the acidity of the immediate cell environment and changes in ventilation should be analysed as carefully as the data will permit. Up to the present no direct method has been employed for studying changes in acidity of the tissue fluids in the brain. The closest approach to the problem has been the study of changes in acidity of the cerebro-spinal fluid. If the assumption is correct that the cerebro-spinal fluid reflects changes in acidity of the tissue fluids in the brain, and if acidity is the primary factor in respiratory control, then changes in hydrogen-ion concentration within the cell rather than in the immediate cell environment is the predominant factor. This is indicated in the experiments on the effects of administration of low oxygen and of cyanide on the acidity of the cerebro-spinal fluid. When low alveolar oxygen is administered by artificial ventilation, the cerebro-spinal fluid may show no immediate change or may turn distinctly acid, but when the oxygen is administered by normal ventilation the change is sharply alkaline, yet ventilation is markedly stimulated under both conditions. When sodium cyanide is administered during artificial ventilation the cerebro-spinal fluid turns acid, but if it be injected during normal ventilation the change is alkaline. Respiration is stimulated in either procedure. While these results by no means indicate that acidity of the immediate cell environment is without effect upon the behaviour of the respiratory centre, they do suggest that changes in the acidity of the interior of the cell is a more determinant factor. However, the elaboration of this phase of the subject must remain in abeyance until further data are obtained.

The results here described represent the work of a number of individuals. The problem of respiratory control was an outgrowth of the studies on blood volume and tissue nutrition begun at the University of California in which E. Blair, C. S. Capp, F. Foote, C. A. Moyle, and R. T. Trotter participated. The work was continued at Washington University, where a theory of respiratory control was outlined and then at the University of Michigan, where several methods and procedures were developed to test the theory. C. S. Capp assisted in the preliminary experiments on the continuous registration of pH changes with the manganese dioxide electrode. These uncompleted experiments were continued the following year and the method applied to animal experiments with the help of A. B. Hertzman. The method for the continuous electrometric registration of volume flow of blood was developed with the help of D. W. Bronk, and the animal experiments continued with the help of D. W. Bronk, T. Bernthal, and N. Codero. The electrometric methods of registering changes in expired oxygen and carbon dioxide were developed with the help of D. A. McGinty, who also participated in the later animal experiments. In this brief summary of our work no effort is made to cover the work of others.

Bequest of a Body.—The late Mr. H. Reeve Everitt, solicitor, of Lowestoft and Norwich, left £100 "and my body to Dr. Arthur Cleveland, in order that he may arrange an autopsy thereon for the benefit of science, and I have left to him the before-mentioned legacy of £100 expressly to cover the cost of this operation and for a meeting of such members of the medical fraternity as he may choose to invite to discuss such unusual points o professional interest as may arise."

tissues, returns to the lungs with a small increment of carbon dioxide. Failure in oxidation at the lungs leads to retention of carbon dioxide by the blood. A highly reduced alkaline hæmoglobin is, therefore, in equilibrium with a relatively low alveolar carbon dioxide tension. During mechanical asphyxia with the lungs filled with oxygen a highly oxidised blood, lightly laden with carbon dioxide and capable of great liberation of oxygen and alkali at the tissues, returns with a large increment of carbon dioxide. Subsequent oxidation of the hæmoglobin at the lungs efficiently expels carbon dioxide. A well-oxidised hæmoglobin is in equilibrium with a high alveolar carbon dioxide tension. The high acidity of the oxidised hæmoglobin is thus indicative of an efficient transport of acid and suggestive of a correspondingly low acidity of the tissues. If this is true, the effects of mechanical asphyxia on respiratory movements with low and high alveolar oxygen pressure may also be placed on an acid basis.

Effects of Low Alveolar Oxygen.

Though the arterial and venous blood turn distinctly alkaline on the administration of low oxygen, the evidence points to a synchronous increase in acidity of the tissues. The major decrease in the hydrogen-ion concentration of the blood is a result of a higher state of reduction of the hæmoglobin with a consequent liberation of free base. This is established by a comparison of the effects of administration of the same gaseous mixture by constant artificial ventilation and by normal ventilation. In the latter, where the animal augments its ventilation, the alkalinity of the blood may be only moderately increased by additional washing-out of carbon dioxide. The increased alkalinity of the blood with normal administration of low oxygen may, therefore, be largely a result of a chemical change which is not related to improved elimination of carbon dioxide. To be sure, a reduction of oxyhæmoglobin at the tissues is conducive to a lowering of the carbon dioxide pressure in the blood and the maintenance of an effective diffusion gradient for the movement of carbon dioxide from the tissues. However, unless the blood is subsequently oxidised and freed of its acid at the lungs so that reduction may be repeated at the tissues, a highly reduced and alkalinised blood will not augment the elimination of carbon dioxide, but will rather lead to a retention of acid. To these conditions must be added the effects of impaired oxidations on the acid metabolism of the tissues, which complete the picture of a broken coördination of the dual function of hæmoglobin. In accordance with theory, not only is the transport and elimination of acid hampered but the formation is momentarily augmented as well.

Indirect evidence for impairment of oxidations and increased tissue acidity during a period of lowered alveolar oxygen is found in the changes in acidity of the blood on readministration of room air during constant artificial ventilation. There is a distinct acid overshooting of the blood. The arterial and venous blood turn more acid than normal and gradually return to the preadministration values. Apparently acid has been accumulating in the body though the blood was turning more alkaline. As further evidence we may note the effects of lowered alveolar oxygen on the hydrogen-ion concentration of the cerebro-spinal fluid. Lowered oxygen increases the acidity, and readministration of room air leads to recovery. The expired gas experiments add to the picture. With the administration of low oxygen the elimination of carbon dioxide falls off at once. If acid is being formed at the usual rate it must thus necessarily be retained. Readministration of room air promptly leads to increased carbon dioxide elimination, which gives way to overshooting and recovery. The carbon dioxide overshooting is accompanied by supernormal oxygen consumption, indicating impairment of oxidations during the period of lowered alveolar oxygen. It is interesting to note the correspondence of the blood acidity and the expired carbon dioxide curves with the administration of low oxygen and readministration of room air by artificial ventilation.

Though the evidence is favourable for increasing acidity of the tissues during the administration of low oxygen by artificial ventilation, it is not as decisive with normal ventilation because of the added washing-out of carbon dioxide from augmented ventilation. The acidity records of the blood under these conditions show decidedly less acid overshooting, particularly with short administrations of low oxygen; but when the administrations are prolonged and severe, distinct acid overshooting invariably occurs, despite the fact that ventilation may be greater than normal. This is evidence for excessive formation of fixed acids in the tissues and subsequent diffusion into the blood stream, for it is difficult to see how the blood can remain more acid than normal during hyperventilation unless the buffer base is reduced by fixed acids from the tissues. The ultimate increased acidity of the cerebro-spinal fluid is further evidence of increased tissue acidity from lowered alveolar oxygen.

Effects of Sodium Cyanide.

Though the initial effects of intravenous injection of sodium cyanide on the blood may be either acid or alkaline, depending upon whether artificial ventilation is administered or whether ventilation is normally controlled, the ultimate effect is increased blood acidity. Here, as with low alveolar oxygen, the acid overshooting is definitely greater with artificial ventilation. Nevertheless, the fact that hyperacidity ultimately results, despite the alkalinising effects of hyperventilation, indicates excessive diffusion of fixed acid from the tissues to the blood, which in turn indicates increased tissue acidity. This is supported by the ultimate effects of cyanide on the acidity of the cerebro-spinal fluid. With artificial ventilation the cerebro-spinal fluid turns acid, and slowly recovers as oxidations return to normal. With normal ventilation the cerebro-spinal fluid may temporarily swing alkaline with the blood, but later it turns more acid than normal. The lymph, as an intermediate fluid lying between the blood and the tissues, must be influenced by chemical changes in both. Knowing the abrupt reduction of oxidations in the tissues, the sudden reduction of carbon dioxide pressure in the arterial blood, and the rapidity of diffusion of carbon dioxide, it is not surprising to find an initial alkaline change with cyanide injection. Likewise, knowing the increased anaerobic formation of lactic acid and the slow diffusion of this acid, it is not surprising to note a delayed increase in the acidity of the cerebro-spinal fluid, although ventilation may be greater than normal. That oxidations are impaired by cyanide is well known and is apparent in the curves of the expired gas experiments. Immediately after injection expired oxygen increases, but with recovery decreases below the normal level. This delayed hyperconsumption of oxygen is a common sequel to the preceding reduction of oxidations, and may be looked upon as a compensatory phenomenon. Overshooting of carbon dioxide elimination accompanies hyperconsumption of oxygen. The changes in gaseous metabolism thus correspond with those produced by administration of low oxygen followed by readministration of room air. The curves of expired carbon dioxide agree in contour with the blood acidity curves when cyanide is given during constant ventilation.

The expired gas experiments in which the expiratory quotients were followed seem to indicate more explicitly the changes in acid metabolism occurring with cyanide administration and recovery. For example, during the early period of administration the expiratory quotient increases, and during recovery it may fall below normal. In one experiment the expiratory quotient rose from 0·98 to 2·02 and subsequently fell to 0·91. In another experiment it rose from 0·93 to 1·39 and fell during recovery to 0·82. The increased expiratory quotient during the initially decreased expiratory exchange is believed to agree with an increased anaerobic production of fixed acid. The subsequent decrease in the expiratory quotient is believed to agree with retention of carbon dioxide and with the dual mechanism of oxidative and non-ase No. 29; mentioned above, showed a striking infection on the fourth day of treatment—i.e., ter the intravenous injection of 300 c.cm. of serum. e primary focus was typical and about 30 mm. in meter, and was situated at the inner side of the ertion of the right deltoid. At first the patient eared to be making good progress, but on the th day there appeared a new crop of vesicles and acent inflammation covering an area of about sq. cm., extending almost to the elbow flexure. lue course a large superficial slough resulted. The subsequent ulcer was successfully overcome by skin-grafting.

Included in the series are two fatal cases. Both came late under treatment. One patient died 15 hours after admission, and the other, moribund on arrival, died four hours afterwards.

Diagnosis.

From the foregoing it is claimed that the early administration of anti-anthrax serum in sufficiently large doses has a marked curative effect in the disease. The recognition of cutaneous anthrax at an early moment is by no means easy, and consequently appropriate treatment may be seriously delayed. The city and port of Liverpool have the largest trade in wool, hair, and hides in the world; in the district there are many tanneries, &c. Hence the local medical practitioners are to some extent on the alert for the possibility of anthrax in the human subject.

An angry "pimple" or papule, without pus, surrounded by a disproportionately large inflammatory areola, especially if it is situated at or near a "rubbed" area, such as the collar or coat-cuff region, should arouse suspicion. Rapid increase of inflammatory redness and swelling, and the formation of a small dark centre with a ring of vesicles should demand instant action. Pain of an acute type is not always present. The term "pustule" is, in my view, unfortunate and misleading. I have not yet seen a "malignant pustule" in which, in the early sloughing phrase, there was any pus evident. The fully developed lesion is strikingly characteristic, showing the brown, purple, or purple-black centre, the ring of yellowish vesicles, and the red, hard, surrounding cellulitis, involving an area extending out of all proportion to the primary focus of infection. The occupation of the patient—e.g., butcher, farmer, tanner, dock labourer, or worker in hair, wool, or allied trades—may give a hint. The likelihood of infection from shaving brushes has now, fortunately, been minimised.

Discovery of *Bacillus anthracis* by examination of a film made from a swab taken from the part is, of course, conclusive evidence. Kneading of the lesion or rupture of a vesicle gives enough serous exudate with which to make a swab and culture. Usually the large Gram-positive anthrax bacillus is easily found, but I have met cases in which, though locally and constitutionally the evidence left no doubt as to the diagnosis of anthrax, the organism could not be found in a direct film, its presence being proved only by culture or animal inoculation. In any doubtful circumstance the wisest course is to give serum. The bacteriological confirmation can then be undertaken without any harmful delay.

Amongst other conditions sent to this hospital as anthrax are simple pustules, boils, carbuncles, insect bites, cellulitis, and accidental vaccinia.

Thanks to the efforts of Dr. A. A. Mussen, the medical officer of health, employers of wool and hair workers are with increasing frequency sending to the Fazakerley Hospital any person who may show even a slightly suspicious "spot" for examination. With the same object propaganda by means of posters about the docks and allied warehouses and factories in which hides, &c., may be handled, will render those concerned more alive to the benefits which follow early recognition and treatment of anthrax infection.

In the past year I have given anti-anthrax serum, empirically, in 10 c.cm. doses, subcutaneously, as a prophylactic, to persons definitely exposed to anthrax infection, in nine instances. These included sanitary inspectors, farmers, and slaughterers who handled the carcasses of cows which had died of anthrax. Although skin scratches or other open wounds were present, none of the men injected developed the disease.

In conclusion I gratefully acknowledge the permission of Dr. Claude Rundle, Medical Superintendent of the City Hospitals, Fazakerley, to describe the cases quoted.

THE TREATMENT OF EPIDERMOPHYTOSIS OF THE TOES (MANGO TOE) AND CERTAIN OTHER FORMS OF EPIDERMOPHYTOSIS BY A FUCHSIN PAINT.

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EPIDERMOPHYTOSIS of the toes is extremely common in the tropics, where it is known by a variety of names—mango toe, Hong-Kong toe, Cantlie's foot-tetter, &c. In recent years the condition has become quite common also in countries situated in the temperate zones, including this country. It is caused, as proved by Sabouraud and Whitfield, by the same fungi that cause ordinary dhobie itch (tinea cruris, tinea inguinalis), the principal species of these fungi being *Epidermophyton cruris*, Castellani, 1905 (synonym *E. inguinalis*, Sabouraud, 1907), and *Epidermophyton rubrum*, Castellani, 1909. Both these fungi were found and described by me in Ceylon in cases of dhobie itch.

The treatment is most difficult as every tropical practitioner and every dermatologist can well testify; it is easy enough to induce a temporary disappearance of the symptoms, but a complete eradication of the infection is in many cases almost impossible, the condition usually recurring after a period of apparent cure. Three years ago, after carrying out a fairly large number of experiments, I introduced in the treatment of the condition a fuchsin paint which has given me very satisfactory results.

Formula of the paint.—The paint has the following formula: saturated alcoholic solution of basic fuchsin 10 c.cm., 5 per cent. aqueous carbolic acid solution 100 c.cm. Filter and add boric acid 1 g. After two hours add 5 c.cm. of acetone; two hours later add resorcin 10 g. The paint should be kept in a dark coloured bottle with glass stopper.

The paint is the ordinary carbol-fuchsin used in bacteriological laboratories for staining tubercle bacilli, to which 1 per cent. boric acid, 5 per cent. acetone, and 10 per cent. resorcin have been added. As a matter of fact simple carbol-fuchsin alone gives good results, but the addition of the boric acid and the acetone seems to enhance its action and make it more penetrating, and resorcin certainly increases its efficacy in most cases. It is applied to the affected parts with a small wad of cotton-wool or a small sponge every day, in some cases several times a day, or every other day or twice a week; if very acute eczematoid symptoms are present it may be diluted with the same amount of water, but usually it may be safely applied undiluted even to most acute eczematoid conditions provided they are of true epidermophytic origin. Certain cases—very exceptional—seem to answer better when the resorcin is omitted from the paint.

Epidermophytosis interdigitalis pedum (mango toe).—In all acute and chronic cases of epidermophytosis

THE SERUM TREATMENT OF CUTANEOUS ANTHRAX.

WITH NOTES ON DIAGNOSIS.

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IN dealing with the treatment of cutaneous anthrax most modern text-books, whilst recognising the value of anti-anthrax serum and recommending its use, still advise surgical excision of the local lesion. During the past four and a half years the cases enumerated in the following table, which have come under my care, have been treated solely with serum, without any resort to excision of the "malignant pustule," the only local application being eusol fomentations.

Results of Serum Treatment.

No.	Age and sex.	Days ill on admission.	Site of lesion.	Serum injected in c.cm.	Number of injections.	Result.
1	42 F	5	Left cheek	400	5	Recovery
2	40 M	5	L. forearm	360	5	"
3	20 F	3	L. upper arm	80	3	"
4	40 M	2	Angle of jaw	220	4	"
5	22 M	5	Back of neck	645	6	"
6	49 M	4	R. forearm*	840	7	"
7	23 M	4	Lower lip	360	4	"
8	49 M	4	Neck, behind ear	370	5	"
9	22 M	3	Back of neck	270	3	"
10	34 F	3	L. cheek	180	3	"
11	28 M	2	Below angle of jaw	360	4	"
12	30 M	6	Back of neck	130	1	Died.†
13	26 M	3	" "	270	3	Recovery
14	24 M	2	L. cheek	160	2	"
15	45 M	2	Back of neck	210	3	"
16	39 M	3	R. cheek*	410	5	"
17	18 M	4	L. cheek	295	4	"
18	20 M	5	Side of neck	330	4	"
19	19 M	2	L. cheek	260	3	"
20	18 F	1	L. great toe	180	2	"
21	34 F	3	Side of neck	270	3	"
22	30 M	1	L. wrist	90	2	"
23	52 M	3	Back of neck	510	5	"
24	19 M	3	L. forearm	240	3	"
25	51 M	4	"	210	2	"
26	41 M	3	R. wrist	270	3	"
27	50 M	7	Neck, middle line, in front	180	1	Died.‡
28	44 M	4	L. cheek	320	3	Recovery
29	19 F	4	R. upper arm	450	4	"
30	61 M	5	R. cheek*	600	2	"
31	28 M	4	R. gluteal fold	330	2	"

Except on four occasions, when an intramuscular injection was made, the serum was given intravenously.
* Two foci. † 15 hours after admission.
‡ 4 hours after admission.

With few exceptions the intravenous route has been chosen for the injection of serum by reason of its prompt therapeutic effect, a distinct advantage in so rapidly ingravescent a disease as anthrax.

The usual glass funnel and tube apparatus is used and the gravitation method of injection is employed, the serum, &c., being warmed in a water bath at 100° F.

The possibility of the occurrence of anaphylactic symptoms must be borne in mind and, if considered desirable, a preliminary test injection of 0·5 c.cm. of serum subcutaneously, half an hour before the major injection, may be made. My experience has led me to omit this test injection, and to begin with 50 c.cm. sterile normal saline solution to which five drops of serum have been added. This is allowed to flow into the vein slowly. In the absence of any untoward signs the concentration of the mixture in the funnel is gradually increased until pure serum is passing. One of the veins in the ante-cubital space is usually chosen for the injection, though in fat subjects the dorsal veins of the hand are sometimes easier of access.

At all times, however, when giving an intravenous injection of serum, it is wise to have at hand a hypodermic syringe, ready charged with atropin sulph., gr. 1/100, for use in case of sudden respiratory spasmodic changes. Twice, in the series under review, have sudden cyanosis and threatened respiratory spasm caused some degree of alarm. In these circumstances the intravenous method has been abandoned and the serum given intramuscularly. Often the patient will complain of a feeling of oppression and heat, and may perspire; but these symptoms usually disappear as confidence increases with subsequent injections.

Dosage and Effects of Serum.

As in other therapeutic sera, no precise rule can be enunciated, but early administration, and that with a generous hand, is the first element of success. As will be seen by a reference to the table, my choice is definitely tending to a large initial dose and quick repetition of the injections, as circumstances demand.

Three factors which operate in each case are: (1) The duration of the disease when the case first comes for injection—i.e., the day of disease; (2) the degree of toxæmia; and (3) the site of the lesion.

Day of Disease.—The earlier the serum is given the more quickly and easily is the advance of the local lesion and the resultant absorption of toxins arrested. Up to three days, generally speaking, the disease is controllable, but after this the treatment rapidly becomes more anxious and prolonged.

Degree of Toxæmia.—The personal resistance of the patient has an undoubted bearing on this, and possibly there may be some variability in virulence of the infecting organism also, since it is noticeable that one case appears to develop signs of toxæmia more rapidly than another, whilst, on the other hand, the effects of the serum are more quickly shown in some cases than in others. A putty-like pallor of the face, listlessness, low tension pulse, sighing respiration, unduly raised temperature, and restlessness alone or variously combined are ominous.

Site of the Lesion.—An anthrax infection within or near the anterior triangle of the neck is always closely attended by the possibility of the swelling and œdema involving the root of the tongue, the pharynx, or particularly, the larynx, and hence this area demands an early large dose of serum in order, as promptly as can be, to limit local inflammatory swelling. Similarly a lesion near the eyelids may by subsequent sloughing produce disfiguring contracture. It may be taken as a rough rule that the further away from the neck that infection is located, the less likely is trouble to be encountered.

The effects of the serum are evidenced locally in about 24 hours by a cessation of further inflammatory swelling, the formation of vesicles abates, the temperature may be somewhat lower, and the patient feels easier. Later the induration shows a slow though definite decline and the part is less swollen. Coincident with these changes the temperature and the pulse-rate fall, usually by a lysis covering two, three, or more days, according to the severity of the case. Meanwhile the vesicles have ruptured or collapsed, and the central dark necrotic zone shows around itself a narrow ring of inflammatory "casting off" reaction. It is my practice to continue giving serum daily until the temperature has definitely fallen to normal level. In passing, I would emphasise that a reliable and fully potent serum is essential to successful treatment in a condition so rapid in its progress as anthrax. In the cases here tabulated I have used the serum of three different makers, and of these I must state that for potency and prompt antitoxic response that supplied by Messrs. Parke, Davis is definitely superior to the others.

The further behaviour of the cases, once serum treatment has been completed, is remarkably free from serious incident. Serum rashes, alone or accompanied by arthralgia and pyrexia, as might be expected after the administration of large amounts, were comparatively severe when they occurred, but a fair proportion of the patients escaped entirely.

The healing of the local focus varied in length of time from 14 days to 35 days, according to the area of the initial lesion and the mass of the resulting slough. Except in one case (No. 29) the final scar was comparatively unnoticeable. One man (No. 14), a mild case, reported to me that he had frontal neuralgia for three months after his scar had healed.

solution and 6 c.cm. of hen's serum. The final dilution of the inoculum was thus 1 in 100. The mixture was distributed in amounts of 2 c.cm. into Carrel's tissue culture flasks,[1] ype D, which were incubated aerobically at 37° C., without aps. The cultures were tested after various periods of cubation by grinding the whole of the contents of each sk with sand and centrifugalising. The supernatant fluid s controlled for the presence of bacteria by aerobic broth culture and titrated as outlined above.

Experimental.

Expt. 1. Titration of the Primary Inoculum.—The first titration was made at the time the inoculum was prepared. The highest dilution tested, 1 in 500, produced a lesion. A second titration, made after he inoculum had been stored in the ice-chest for en days, resulted in a dilution of 1 in 2500 producing lesion. A dilution of 1 in 12,500 caused no reaction.

Expt. 2. First Series of Cultures of Virus.—After storage for six days in the cold room the primary inoculum was used for the first series of cultures. The titre of the inoculum was 1 in 2500 (Expt. 1), and its dilution in these cultures was 1 in 100. Cultures were titrated in duplicate. The results are summarised below.

After incubation for 1 day, 1 in 125 pos.*
" " 3 days, 1 in 625 pos.*
" " 5 " 1 in 625 pos.*
" " 7 " 1 in 3125 pos.*
(Pos. = vaccinia lesion. Neg. = no vaccinia lesion.)
* Highest dilution tested.

Expt. 3. Second Series of Cultures of Virus.—The inoculum for this series was the supernatant fluid from a culture of Expt. 2 which had been incubated for five days. It was free from bacteria as tested by aerobic culture in broth, and had been in the cold room for four days before it was used for this experiment. The dilution of the inoculum in these cultures was 1 in 100. Cultures were titrated in duplicate.

After incubation for 1 day, 1 in 5 pos., 1 in 25 neg.
" " 5 days, 1 in 625 pos.*
" " 8 days, 1 in 625 pos.*
* Highest dilution tested.

A dilution of 1 in 625 in this series represented a dilution of 1 in 625×10^4 of the primary inoculum.

Expt. 4. Third Series of Cultures of Virus.—The inoculum was the supernatant fluid of a five-day culture from Expt. 3. It had been in the cold room for two days, was free from bacteria as tested by erobic culture in broth. and was diluted 1 in 100 in tting up the cultures. Cultures were again titrated duplicate.

After incubation for 1 day, 1 in 5 pos., 1 in 25 neg.
" " 5 days, 1 in 625 pos.*
" " 8 days, 1 in 625 pos.*
* Highest dilution tested.

A dilution of 1 in 625 in this series represented a dilution of 1 in 625×10^6 of the primary inoculum.

Expt. 5. Fourth Series of Cultures of Virus.—The inoculum was the supernatant fluid of an eight-day culture from Expt. 4. It was not stored before use and was diluted 1 in 100 in setting up the cultures. Cultures were titrated in duplicate.

After incubation for 1 day, 1 in 25 pos., 1 in 125 neg.
" " 5 days, (a) 1 in 125 pos., 1 in 625 neg.
" " 5 days, (b) 1 in 625 pos.*
* Highest dilution tested.

A dilution of 1 in 625 in this series represented a ilution of 1 in 625×10^8 of the primary inoculum. xcept for the five-day cultures in this experiment the ults of titrating duplicate cultures were identical oughout. The supernatant fluid from the five-day ltures was free from bacteria as tested by aerobic broth cultures.

Expt. 6. Neutralisation of Primary Inoculum, Virus from Third and Fourth Series of Cultures and Lymph from Government Laboratory by Anti-vaccinia Serum.—Neutralisation experiments were made with anti-vaccinia rabbit serum. Virus was diluted with Tyrode's solution and divided into two parts. To one part an equal volume of Tyrode's solution was added and to the other an equal volume of anti-vaccinia serum. After the mixtures had stood for two hours at room temperature, 0·2 c.cm. of each was inoculated intradermally into the skin of a rabbit. The viruses tested and the final dilutions were as follows: (*a*) primary inoculum 1 in 50; (*b*) Government lymph 1 in 50; (*c*) supernatant fluid from an eight-day culture, Expt. 4, 1 in 5; (*d*) supernatant fluid from a five-day culture (*a*) Expt. 5, 1 in 5.

In each instance the virus in Tyrode's solution produced a lesion and no lesion resulted from the virus with serum.

Expt. 7. Had the Medium alone after Incubation an Adjuvant Effect on Infectivity of Virus?—Cultures were made as described except that they contained no inoculum. After they had been incubated for six days at 37° C. the contents of the flasks were put into a mortar and primary inoculum was added, so that it became diluted 1 in 100. The mixture was then treated as a culture—i.e., it was ground in sand and centrifugalised. The supernatant fluid was titrated and compared with the titration of corresponding dilutions of the primary inoculum in Tyrode's solution. The titrations produced identical results. In each instance a dilution of the primary inoculum of 1 in 2500 caused a lesion; a dilution of 1 in 12,500 did not.

Discussion.

During four successive cultures vaccinia virus has increased approximately 25×10^6 times. There was also evidence of increase in comparing the titrations of cultures after incubation for one day and after incubation for five to eight days in Expts. 2, 3, 4, and 5. The experiments were not carried beyond the fourth series of cultures.

In comparing the results of this technique with the growth of vaccinia virus in tissue cultures it is of interest to note the uniformity of results obtained. Whereas only a varying proportion of tissue cultures give evidence of multiplication of the virus, we were impressed by the regularity of the results of titration of cultures in duplicate after incubation for from five to eight days, and also by the similarity of results in successive experiments.

In these cultures we were not able to detect any tissue growth; after 24 hours the small pieces of kidney had begun to disintegrate, and by the third day autolysis of the tissue was extensive.

We wish to express our thanks to Prof. J. C. G. Ledingham, F.R.S., who kindly provided the anti-vaccinia serum, and to Dr. F. R. Blaxall, who supplied some Government lymph.

VICTORIA INFIRMARY, NEWCASTLE-ON-TYNE.—The report of the work of this hospital for 1927 contains some remarkable figures. Since 1907 the number of in-patients has increased from 6445 to 13,806, of new out-patients from 32,444 to 130,352, of out-patient attendances from 93,244 to 383,464; operations last year numbered 14,523 as compared with 5078 in 1907. The waiting-list has been periodically reviewed, yet it still contained 1840 names. The abnormal growth in out-patients' attendances is causing the house committee to inquire into the possibility of curtailing some part of the work. The number of motor accident cases has increased by 138 to 1121, and the 572 beds available were inadequate throughout the year. At the end of the present month the infirmary will come into possession of the adjoining premises, until now occupied as an orthopædic hospital by the Ministry of Pensions, and the honorary medical and surgical staff have outlined a scheme for the adaptation of part of the premises as paying wards, but no decision has been reached. Meanwhile the appeal for £150,000 for extensions made last year is being pressed forward.

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[1] Carrel, A.: Jour. Exper. Med., 1923, xxxviii., 407.

interdigitalis pedum the result is generally satisfactory, especially so in cases with secondary pyogenic infection. In the past, when the associated pyogenic infection was very heavy and there was present diffuse redness with small pustules and abrasions, I used, at first, to keep the parts moist with a saturated boric lotion or a boric resorcin lotion, for two or three days before starting the fuchsin paint. Now, however, in every case, I use the fuchsin treatment immediately with good results. With regard to the details of the treatment,—viz., frequency of applications, length of treatment, &c.—each case has, of course, to be treated on its own merits, but a safe general rule is to apply the paint freely two or three times daily for a week, then give three days' rest, then apply the paint again once or twice daily, for another week. In some cases the treatment has to be carried out for a much longer period of time.

Other types of epidermophytosis. Mycotic pruritus ani et vulvæ.—In addition to epidermophytosis of the toes I found the paint useful in certain other types of epidermophytosis. As I have stated elsewhere a fairly large number of cases of pruritus ani and pruritus vulvæ are of mycotic origin; very often we are dealing with a latent epidermophytosis with superadded saccharomycetic, cryptococcal, monilial, and bacterial infections. In a number of these cases the paint acts well.

Illustrative case.—Mrs. A. (London) complained for several weeks of unbearable vaginal and anal pruritus. On examination an eczematoid condition of the labia majora and of the perianal region was present; the patient complained of pruritus also in the labia minora and in the clitoris. The paint was applied freely not only to the external surface of the labia majora but also to the internal surface, and also to the labia minora and clitoris; at first diluted with equal part of water, then neat as it caused no smarting. The application was done at first every other day, then twice a week, then once a week. Within three weeks the condition was completely cured. From this case, before starting the treatment, an epidermophyton (*E. rubrum*) was grown and, in addition, a monilia and various bacteria, also a most peculiar organism which I was uncertain at first how to classify as certain forms of it resembled a cryptococcus, others a thick bacillus. I have described it elsewhere under the name *Bacillus multiformis.* (Proc. Soc. Exper. Biol. and Med., 1928, xxv., 539.)

Epidermophytosis cruris (inguinalis); epidermophytosis corporis.—While most cases of tinea cruris (dhobie itch) answer well to the usual routine treatment by salicylic-benzoic acid ointment (Whitfield's ointment) consisting of salicylic acid grs. xxx., benzoic acid grs. xxx., and vaseline 1 oz., or my older salicylic-sulphur ointment (ac. salicyl. grs. xxx., sulphur præc. grs. xxx., vaseline ad ℥i.) in a certain percentage of cases the result is unsatisfactory, and in some of these I have found the paint useful. As a method of routine, however, the use of ointments is much simpler and preferable.

Cases of epidermophytosis simulating moist eczema.—In these the paint seems to be very successful, especially when the lesions are on the arms, hands, and feet.

Epidermophytic pompholyx.—The deep, tense vesicles should be opened and then the paint applied frequently all over the affected region, usually the fingers and palms of the hands. In this type of epidermophytosis the paint does not answer so well as in the pure eczematous type. In certain cases it is of advantage—provided there are no moist eczematoid lesions associated with the pompholyx—to apply frequently for two days before starting the fuchsin treatment a lotion containing menthol or thymol grs. ii.–v., ac. salicylici grs. xxx.–ʒi., resorcin grs. xv.–xxx., spir. rect. ℥ii.–iv., aq. dest. ad ℥vi.

Post-epidermophytosis pruritus.—In previous publications I have called attention to the occurrence of post-epidermophytosis pruritus—viz., cases in which after the usual routine treatment all the objective symptoms of epidermophytosis disappear but the pruritus remains for weeks and months. The pruritus may be of different origin: (*a*) although the clinical signs have disappeared the mycotic infection is still present; (*b*) over-treatment and mild hypersensitivity to the various antimycotic ointments; (*c*) nervous origin; in some highly strung individuals the pruritus remains long after the infection has disappeared. In the first group of cases the application of the carbol-fuchsin paint will be found useful.

Conclusion.

A paint consisting of carbol-fuchsin 100 c.cm., boric acid 1 g., acetone 5 c.cm., resorcin 10 g., gives very satisfactory results in the treatment of epidermophytosis of the toes (mango toe), both in the acute type and chronic type with presence or absence of secondary bacterial infections. It is useful also in certain other forms of epidermophytosis, especially in cases showing signs of moist eczematous dermatitis, the very cases in which salves are contraindicated, as in such cases, as a rule, they increase the inflammatory symptoms. With regard to ordinary dhobie itch (tinea cruris, tinea inguinalis) the paint acts well, but the routine treatment by Whitfield's salicylic-benzoic ointment or my old salicylic-sulphur ointment is much simpler and to be preferred.

A disadvantage of using the paint is the deep red colouring of the skin, but patients who have suffered from epidermophytosis interdigitalis pedum for years and have tried all sorts of treatment do not object to it. So far I have not come across—among over a hundred patients—a single case of hypersensitiveness to the paint, but no doubt if this method of treatment should become generalised, such hypersensitive individuals will be found, and therefore at first the paint should be applied with care and in small amount.

Refcrence.—Castellani: Gehrmann Lectures on Fungi and Fungal Diseases, delivered before the University of Illinois, Chicago, 1926, and published in the Archives of Dermatology and Syphilology, October, November, December, 1927; January, February, and March, 1928.

CULTIVATION OF VACCINIA VIRUS WITHOUT TISSUE CULTURE.

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M.R.C.S. ENG.,
PROFESSOR OF BACTERIOLOGY;
AND
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(From the Department of Bacteriology and Preventive Medicine in the University of Manchester.)

THE set of experiments which form the subject of this note was made during the course of systematic investigations on the cultivation of filterable viruses. Indications had been obtained that it would be desirable to determine whether the virus of vaccinia would multiply under the conditions of culture to be described.

Technique.

Commercial vaccine lymph was inoculated into the testes of an adult rabbit. After four days the testes were markedly swollen and hæmorrhagic. They were removed and ground in sand and m/50 phosphate, pH 7·6. The mixture was centrifugalised and the supernatant fluid (about 5 c.cm.) was used for the primary inoculum. It was free from bacteria as tested by aerobic broth culture.

Titrations were made by inoculating 0·2 c.cm. of a series of dilutions intradermally into the skin of the back of adult rabbits. The diluting fluid throughout was m/50 phosphate, pH 7·6.

The method of preparing and testing cultures was as follows. Blood was withdrawn from a hen and after it had clotted the serum was collected. The hen was killed with chloroform and ether, and the kidneys, which were removed aseptically, were minced finely with scissors. Into a flask was put 0·66 c.cm. (approximately) of minced kidney and 1·33 c.cm. of inoculum diluted 1 in 6·6 with Tyrode's solution. The mixture was allowed to stand in the cold room for four hours. Then were added 12 c.cm. of Tyrode's solution and 6 c.cm. of hen's serum. The final dilution of the inoculum was thus 1 in 100. The mixture was distributed in amounts of 2 c.cm. into Carrel's tissue culture flasks,[1] type D, which were incubated aerobically at 37° C., without caps. The cultures were tested after various periods of incubation by grinding the whole of the contents of each flask with sand and centrifugalising. The supernatant fluid was controlled for the presence of bacteria by aerobic broth ulture and titrated as outlined above.

Experimental.

Expt. 1. Titration of the Primary Inoculum.—The st titration was made at the time the inoculum is prepared. The highest dilution tested, 1 in 500, oduced a lesion. A second titration, made after inoculum had been stored in the ice-chest for days, resulted in a dilution of 1 in 2500 producing a lesion. A dilution of 1 in 12,500 caused no reaction.

Expt. 2. First Series of Cultures of Virus.—After storage for six days in the cold room the primary inoculum was used for the first series of cultures. The titre of the inoculum was 1 in 2500 (Expt. 1), and its dilution in these cultures was 1 in 100. Cultures were titrated in duplicate. The results are summarised below.

After incubation for 1 day, 1 in 125 pos.*
,, ,, 3 days, 1 in 625 pos.*
,, ,, 5 ,, 1 in 625 pos.*
,, ,, 7 ,, 1 in 3125 pos.*
(Pos. = vaccinia lesion. Neg. = no vaccinia lesion.)
* Highest dilution tested.

Expt. 3. Second Series of Cultures of Virus.—The oculum for this series was the supernatant fluid om a culture of Expt. 2 which had been incubated five days. It was free from bacteria as tested by obic culture in broth, and had been in the cold room for four days before it was used for this experiment. The dilution of the inoculum in these cultures as 1 in 100. Cultures were titrated in duplicate.

After incubation for 1 day, 1 in 5 pos., 1 in 25 neg.
,, ,, 5 days, 1 in 625 pos.*
,, ,, 8 days, 1 in 625 pos.*
* Highest dilution tested.

dilution of 1 in 625 in this series represented a ilution of 1 in 625×10^4 of the primary inoculum.

Expt. 4. Third Series of Cultures of Virus.—The inoculum was the supernatant fluid of a five-day culture from Expt. 3. It had been in the cold room for two days, was free from bacteria as tested by aerobic culture in broth, and was diluted 1 in 100 in setting up the cultures. Cultures were again titrated in duplicate.

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In each instance the virus in Tyrode's solution produced a lesion and no lesion resulted from the virus with serum.

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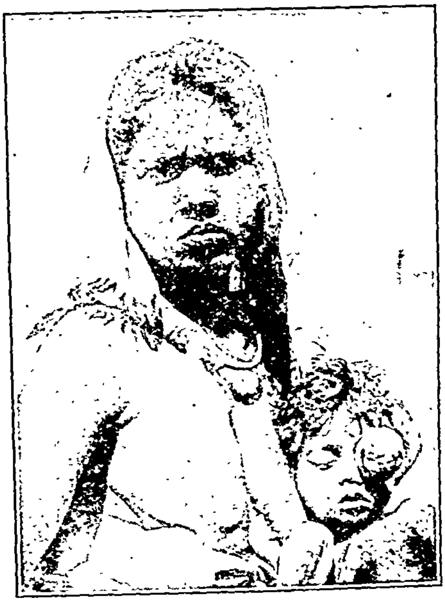
Clinical and Laboratory Notes.

A CASE OF GLIOSARCOMA OF THE RETINA IN A CHILD OF THREE.

By E. Charlton Hudson, M.B., B.S. Lond.,
MEDICAL SUPERINTENDENT, SANTAL MISSIONARY HOSPITAL, BENGAL.

In the following somewhat rare case the patient was carried a distance of 30 miles, probably on foot, by the parents, from whom the history was elicited with difficulty as they were very ignorant and poor villagers.

A Hindu (Bengali) female child, aged 3, was first seen on March 17th, 1928. She had been born normal with perfect eyes, and there was no history of any injury. Four months before admission her eyes had begun to "water"; then the left eye became red and, later, cloudy. The left eye was said first to have retracted for about a month; then it began to bulge.



Child, front view. Note intact but over-stretched margin of eyelids formed into a ring. Note also two large circular fungating ulcers. The mother with plenty of milk was still suckling her only child at 3 years.

When brought to hospital the child was so irritable that gr. 1/12th morphia had to be given hypodermically before examination, but the tumour did not seem particularly painful. The left eye was found to have been completely destroyed by an ulcerating tumour, the size of a lemon, protruding from the orbit and evaginating the palpebral conjunctiva. The eyelids were intact but greatly stretched. The tumour was firm and fleshy with a feeling of resilience. The child was otherwise normal and in fair condition (feeding on rice, &c., and still suckling from its mother). The right eye was sound and there were no signs of any secondary deposits elsewhere in the body, glands or otherwise.

Treatment.—Complete exenteration of the orbit, as far as possible in one piece, was performed under a general anæsthetic (A.C.E. and ether) on March 22nd. It was a difficult operation on account of tension of the orbital contents and the advisability of removal in one piece intact. The external canthus was slit to give greater freedom for extraction. No operating gloves were used. During the removal a cystic portion burst and a semi-fluid exuded in the form of soft, lumpy, glial contents of a crushed blackberry colour, suggesting degenerating tissue stained by blood. This came from the upper and medial quadrant of the tumour, slightly decreasing its volume and so facilitating extraction. The greater portion of the tumour was fairly firm. There was no invasion of the orbit and the periosteum was stripped clean everywhere up to the margin. The growth appeared to have extended backwards along the optic nerve to the base of the brain through the optic foramen, as the optic nerve was somewhat pulpy. The nerve was cut through as far back as possible. There was little bleeding of the stump, and this was controlled by hot saline flush and pressure pad, as artery forceps proved of little value. The redundant over-stretched eyelids were then trimmed and the cilial margins cut away. The orbit was packed with gauze soaked in acriflavine and liquid paraffin mixture.

The child had a reactionary post-operative temperature of 101° F. the same evening, which had dropped to normal the next day, rising again to 100° F. on the third day, and thereafter normal until an incidental attack of dysentery set in and passed off after treatment.

The first dressing was carried out under general anæsthesia on the third day, when the stump of the optic nerve was cauterised with pure carbolic acid and a ribbon gauze dressing of acriflavine and paraffin repeated. Thenceforward similar daily dressings of very light packing after irrigating with electrolytic chlorine were carried out for about 14 days, when acriflavine and paraffin were discontinued.

The child made much better progress than was expected considering the primitive aseptic and antiseptic conditions in a new hospital in the jungle 22 miles from the railway. The parents, against medical advice, took the child away 31 days after the operation, before the wound was healed or a skin graft had been attempted. Nothing has been heard since.

THE COOKING OF LIVER FOR THE TREATMENT OF PERNICIOUS ANÆMIA.

By C. E. Pollock, M.R.C.S. Eng.,
MAJOR-GENERAL, LATE A.M.S.

Liver as usually cooked soon palls. Being myself an involuntary member of the "honourable company of liverers," and not relishing the prospect of having to eat the same preparation of liver four or five days a week, I set to work to find ways of converting our mainstay of life into an attractive item on the menu. I give the results obtained up to the present, and with further experience I hope to add to the list.

When cooking liver the following general rules should be observed:—

(*a*) Fresh ox liver is more effective than calf liver.

(*b*) The cooking should be short, and the temperature should be kept as low as possible—just sufficient to make the liver seem to have been cooked.

(*c*) No more fat should be used than is actually necessary for each dish.

(*d*) Grilling makes the liver tough.

(*e*) Only a little salt should be used in the cooking; more can be added when it is eaten.

(*f*) Any sweet flavouring, such as chutney, should be used sparingly.

Some Recipes.

Liver Sandwiches.—The following has been successfully used by friends for a child. Put the raw liver through a mincer and remove any fibrous parts. Spread the minced liver on thinly cut slices of bread and butter, or a piece of toast which has been split in two. In either case use little or no butter. Add pepper and salt according to taste, sprinkle it freely with fresh lemon juice, and a trace of grated onion. A few dabs of Bovril. or a thin layer of grated cooked ham improves the flavour. Finely chopped pickles may be used in place of ham.

Fried Liver.—Cut the liver into rather thin slices. Put a small quantity of butter, margarine, or a slice of not very fat bacon into the frying-pan and heat to low frying temperature. Cook gently for five to ten minutes to suit the individual's taste.

Dry Curry.—Slice the liver as above. Put into the frying-pan a little butter and a dessert-spoonful of chutney with a squeeze of lemon juice. Heat this while stirring it to a low frying temperature. Roll the slices of liver in dry curry powder and place them in the pan. Cook gently for five to ten minutes.

Liver Purées.—(*a*) Prepare a white sauce. Stir in 6 oz. of grated raw carrot, if it is coarse, or, if young carrots are obtainable, the same quantity finely chopped. Boil gently for a few minutes. Stir in the minced raw liver and let it stand for three minutes on the warm top of the stove, away from the flame.

(b) Prepare a brown gravy, using as little fatty substance as possible. Bring this to the boil, then move the pan away from the flame, and stir in the minced raw liver. Let it stand for three to five minutes. Green peas or finely sliced young carrots improve the flavour. Serve on toast.

(c) Prepare a breakfast-cupful of Bovril or Marmite. Bring it to the boil, stir in the minced liver, and let it stand for a couple of minutes on the top of the hot stove. This is very useful when the liver is required at short notice.

Liver Soups.—Prepare a breakfast-cupful of any of the following soups: tomato, veal broth, chicken, or rabbit broth. Many others, such as potato soup, game soup, milk and celery soup, make a pleasant variation. Bring the soup up to the boil. Take the pan off the fire, stir in the minced raw liver, and let it stand for a few minutes.

Minced Liver on Toast.—Prepare a tasty gravy flavoured with a sauce such as A.1 or Harvey's. Chop the liver and cook gently in the gravy for three minutes, spread it on the toast, and serve hot.

Liver and Eggs.—Minced raw liver may be beaten up with milk and eggs and served as scrambled eggs. An omelette may be filled with minced liver cooked slightly in a tasty gravy.

Liver Roll.—Mince together 12 oz. of liver, 6 oz. of beef (preferably steak), and 6 oz. of rather lean bacon. Add a trace of finely chopped onion. Mix a teacupful of bread-crumbs with the minced liver and bacon. Beat up one egg and stir it into the liver mixture, flavouring the whole with a little tomato sauce. Wrap it in grease-proof paper, and cook in a steamer from one to one and a half hours. Let t get cold and eat it as a sandwich, or in place of cold neat. This is a useful preparation when travelling.

Risotto.—Boil some rice in the ordinary way. Cut the liver into dice of about half an inch, and cook in a savoury sauce, tomato for preference. Place the cooked rice in a hot dish, making a hollow in the middle. Put the liver into this. If preferred, the liver may be sprinkled with lemon juice and lightly fried. In this case a well-flavoured sauce should be served to pour over the rice. Cooked macaroni may be used in place of rice.

Stuffed Potatoes.—Bake or boil two large potatoes in their skins. When cooked cut off the upper third. Scoop out one-third of the potato. Into the space thus formed put minced liver, previously cooked in brown gravy and well seasoned with ketchup and lemon juice. Mash the removed potato, and use some of it to form a cap to the liver. Place a thin slice of bacon over the top, and put them into a hot oven for three minutes.

Chicken and Liver Fricassee.—Minced liver mixes well with chicken fricassee prepared in the ordinary way.

Toad-in-the-Hole.—Liver may be used in this dish in place of beef. When making the batter stir in a teaspoonful of ketchup. Cold cooked liver and potato salad made with mayonnaise is excellent for an occasional change, but contains too much oil to be used frequently.

With experience other recipes will suggest themselves to the interested cook, and the anæmic brother will bless her ingenuity.

A CASE OF
MULTIPLE COMPOUND FRACTURE OF THE SKULL.
WITH RECOVERY.

BY C. R. H. TICHBORNE, L.A.H. DUB., M.S.A.,
MEDICAL OFFICER, KONDOA-IRANGI, TANGANYIKA.

IN his village of Sandawe a man had a quarrel with his wife; on the pretence of cutting wood, he took her out into the bush, and there attempted brutally to murder her. The woman was brought into hospital with six wounds on her head, five of which were complete compound fractures of the vault of the skull: at first appearance the head seemed almost severed from her body. the injuries were three days old, the head wrapped in a filthy blood-stained native cloth, was covered with mud, the several muscles and torn scalp sloughing, and a general septic state prevailed. Under these conditions the prognosis seemed hopeless; nevertheless the patient did live, and attended the court three months subsequently. Besides a scalp wound 3 in. long and reaching to the bone, there were five complete compound fractures of the vault of the skull; these wounds were inflicted by a panga. The fractures were: one left temporal, one frontal, one right parietal, one left parietal, and one fracture of occipital bone 5 in. long, and 1½ in. gap; all these fractures communicated with the surface of the brain, and in all cases the cerebral meninges were exposed. It would seem almost miraculous, considering the anatomical relations of the middle meningeal artery, especially its anterior branch, also the temporals externally, that these vessels could have escaped rupture with ensuing fatal hæmorrhage.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the 1927 statistics of five English, one Welsh, and two Scottish counties:—

Name of county and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Surrey (792,300)	14·2	10·7	0·71	1·81	2·0	1·6	46	2·0	3·0
Warwickshire (377,900)	17·3	11·2	0·76	1·36	2·1	1·5	66	3·8	2·9
East Sussex (268,200)	12·6	12·4	0·67	1·66	2·0	2·3	44	1·8	5·0
Northamptonshire (215,000)	14·4	11·8	0·89	1·48	2·2	1·9	51	1·9	5·1
Cumberland (216,130)	17·2	13·6	0·85	1·40	2·8	2·0	81	6·7	5·4
Breconshire (61,150)	16·7	12·8	0·98	1·04	2·8	2·0	79	5·8	7·8
Aberdeen* (107,224)	21·2	13·4	0·83	1·55	2·1	2·0	73†	3·9	3·9
Fife* (110,689)	19·2	11·8	0·60	1·11	2·4	1·3	86	4·2	7·5

* Extra burghal or landward area. † Including the burghs, except Peterhead and Fraserburgh.

Surrey.

Dr. T. Ruddock West, deputy M.O.H., describes the continued attention given to the river Wandle. The rapid building up of the districts in this valley has given rise to engineering and legal problems owing to the sudden increases in the volume of the river after the fall of rain on the much larger proportion of impermeable surface. As the swollen river subsides the oil is deposited and gives rise to offensive smell and unsightly conditions. The Carshalton section of the river, which was subject to much chemical pollution, is now free from pollution from trade wastes and sewage, while the stretch of the river from the female orphanage to Beddington Park has been cleaned and the velocity of the stream much improved. During the year there were 149 notifications of puerperal fever and pyrexia with six applications for a second opinion and eight for admission to hospital. It is thought that the facilities provided will be more used when the scheme becomes widely known. The number of cases admitted to maternity homes under the Council's scheme shows a steady increase. Thus the admissions during the last five years were 44, 54, 104, 160, and 183.

The whole-time chief veterinary officer appointed by the council took up his duties in July. Pending arrangements for the periodical inspection of all dairy herds notifications of milk containing tubercle bacilli or streptococci of bovine mastitis are investigated. It is frequently found that although the notifications received may refer to only one farm, the sample contains other milk purchased by the vending farmer. As the result of 11 "outside" notifications of tuberculous milk four animals were dealt with under the Order, and of five others suffering from tubercle four were slaughtered by the owners and one died during the investigation. In seven cases no confirmatory evidence by microscopical and biological tests of tuberculous infection was obtained. In the case of the four milk samples containing streptococci four animals were discovered suffering from mastitis, and the owners' attention was drawn to the fact that it was an offence to sell such milk.

The number of blind persons on the register is gradually increasing. At the end of 1924 there were 523 and at the end of 1927, 744. The council subscribe £100 per annum to the National Library for the Blind and in return the library supplies books and music to blind persons in Surrey. The school report shows that the parents of 219 children objected to routine medical inspection. In 40 cases the objection was withdrawn after explanation and in 46 the inspection schedule was completed by a private practitioner. The school nurses also act as health and tuberculosis visitors. The cost of installing drinking fountains of special type to take the place of the drinking vessels (mostly enamelled iron mugs) used in common by the scholars is considered by the council to be prohibitive. Great success is claimed for the system instituted in June, 1925, by which contacts of certain infectious diseases remain at school under the supervision of the school nurse instead of being excluded. Owing to the epidemic of influenza which swept the county during January and February the number of days of school closure compares unfavourably with the previous year. In the case of several schools, after meetings of the parents at which the procedure was explained, immunisation of children against diphtheria has been practised. Nearly 1000 children have been immunised. There are now within the county 73 minor ailment, 31 dental, and 27 eye clinics. When one more additional dental surgeon has been appointed in 1928 dental treatment will be available for the school-children at every age. Under the orthopædic scheme, which included seven centres, 729 children received 12,222 treatments.

Warwickshire.

Dr. A. Hamilton Wood reports that after an absence from the county since July, 1925, small-pox appeared in epidemic form during the last quarter. There were 55 cases notified chiefly in Nuneaton, Foleshill, and the Atherstone and Coventry rural districts. At the time of writing the report the disease was under control. The outbreak, says Dr. Wood, would have been even more limited if the offer of vaccination had been generally accepted. The disease was usually of a mild type, but in some cases led to disfigurement. There was an outbreak of enteric fever causing 22 cases in Southam. The source of the outbreak was a well contaminated with sewage, as evidenced by bacteriological examination and the discovery of leakage from a drain. There were 12 notifications of encephalitis lethargica in the urban and 12 in the rural districts and 16 deaths.

Some improvement is reported as to river pollution. The condition of the Tame is likely to be improved by the efforts of the Upper Tame Joint Committee and the extension of the bio-aeration process at the Birmingham Tame and Rea works. The pollution by paper mills is to be reduced by the introduction of machinery which will extract fibre from the residue, to be used again instead of its being discharged as waste. The state of the Avon is improved by better treatment at the Rugby works. Coventry, which is in a difficult position, owing to the fact that the volume of the effluent in dry weather is equal to that of the river, is contemplating new works at an estimated cost of £226,000. It is thought that the ten miles stretch of the river between Baginton and Warwick may, as the result of these schemes, become once more capable of maintaining fish life. The policy of the county council is to investigate all cases of tuberculous milk reported from outside, and in addition to take 100 bulk samples. There were 31 outside notifications, which resulted in 12 cows being slaughtered under the Tuberculosis Order. Of 85 bulk samples examined biologically three were found to be tubercle-infected. During the year about 2000 swabs were examined from diphtheria cases and contacts, but only five virulence tests were carried out. It is thought that full advantage will be taken of the virulence test in future when its extreme usefulness is appreciated.

The orthopædic scheme comprises five clinics, but another clinic is required in the north of the county to complete the scheme. Of 52 cases of puerperal fever and pyrexia a second opinion was asked for in six cases, and 12 cases were removed to hospital. If the case is treated at home the nurse-midwife takes charge and is compensated for the loss which she incurs by handing over her normal cases to other midwives. The higher death-rate and infant mortality as compared with the previous year was accounted for by the influenza epidemic, which was responsible for 211 deaths as against 85 in 1926.

East Sussex.

Dr. A. G. R. Foulerton gives the result of following up tuberculous milk samples notified by outside authorities from Sept. 1st, 1925, to Dec. 31st, 1927. During these 28 months the notifications numbered 31, and as a result 34 farms were inspected and 14 cows dealt with under the Tuberculosis Order. A table shows the average infant mortality in the county for the four years 1924–27 as 44·7 and the figures for the three preceding six-year periods as 80·2, 70·9, and 53·8. During the same four periods the infant mortality for England and Wales was 119, 100·8, 82·5, and 72·2. The deaths from tuberculosis during the year numbered 181 and the number of cases on the revised register is 1027. In April, 1928, there were only four parishes, with a total population of 1463, without the services of a district nurse. At the end of the year there were 25 registered maternity homes in the county. Dr. J. R. Dingley, the medical superintendent, reports that an orthopædic visiting surgeon has been appointed for Darvell Hall Sanatorium. Dr. Dingley is impressed with the satisfactory results obtained by artificial pneumothorax in suitable cases, and favours its more extensive use for early cases. Occasionally he finds sanocrysin of benefit. In furtherance of the scheme for occupational therapy a workshop has been equipped for the patients and is in the charge of a skilled joiner, an ex-patient.

Northamptonshire.

Dr. L. Meredith Davies reports an epidemic of influenza between the third week in January and the first week in March, during which time 139 school departments were closed for varying periods. A somewhat excessive prevalence of paratyphoid fever, chiefly in the Kettering neighbourhood, during the latter half of the year was exhaustively investigated and was thought to be associated with a carrier employed at a large bakery. One case of small-pox was imported from Durham. The occupations followed by the new cases of tuberculosis do not suggest that the incidence of tuberculosis in the boot and shoe industry is unduly high. Artificial light treatment at the Wellingborough dispensary appears to give the best results in the case of tuberculous glands with discharging sinuses and is somewhat less beneficial for lupus, while its value for pulmonary disease is doubtful. Dr. Davies discusses the failure to get early cases of phthisis under treatment and is inclined to favour the establishment of preventoria as in Germany and America, the adoption of the "Grancher" system, and the more extensive use of open-air schools, both day and residential. The notifications of ophthalmia neonatorum numbered

28, of which 23 were treated at home and 5 in hospital, including 2 babies born in the hospital. One case of total blindness resulted, but the circumstances of this case are not given.

The orthopædic scheme now comprises five clinics based on the Manfield Hospital. The 14 notified cases of puerperal fever were investigated. Ten of the cases were treated in hospital and special nurses were rovided for two. Particulars are also given of the 7 notified cases of puerperal pyrexia, 7 of which were eated in hospital, and for 3 of which special nurses were provided. There were no applications from practitioners for antistreptococcal serum or for bacteriological examinations. Nine complaints of tuberculous milk were received from the L.C.C., but only two infected cows were discovered and dealt with under the Order. In several districts veterinary nspection is in force. Fifteen tuberculous cows were iscovered by the Kettering inspector, of which two were not in milk and in three the disease was "not advanced." All 15 were dealt with under the Order. Four tuberculous cows were found by inspection in the Wellingborough district, one in Oundle, and none in the other five districts.

Cumberland.

Dr. F. H. Morison states that many of the recommendations for improvements and extensions made in the years 1924 and 1925 have been carried out. As regards future developments, he recommends two which will not be expensive. The first is a subsidised bed for children at the Cumberland Infirmary, which might be used for operations for rupture, squint and eye conditions, skin diseases, and for observation in obscure cases. The second is the provision of a bacteriological laboratory in the county, which would not be an additional expense but take the place of laboratory work now done for the county in Manchester and London. Other more costly needs which he presses are: 1. The appointment of a woman medical officer to coördinate maternity and child welfare work, to enable new centres to be opened, and to develop antenatal work among expectant mothers. 2. Additions to the dental staff. At present there is only one dental surgeon and one nurse, and half of the school-children receive no dental treatment at all. In order to provide an efficient dental scheme five dental officers and five nurses would be required, but the appointment of a second dental officer and nurse would at least enable urgent cases all over the county to receive prompt attention. 3. The provision of an open-air school, or at least the retention of beds in such a school, or in a seaside convalescent home. 4. Provision for the isolation of advanced cases of pulmonary tuberculosis and of beds for observation purposes. 5. The establishment of some such scheme as the Grancher system for child contacts of open tuberculosis. 6. The establishment of clinics and dispensaries at Arlecdon, Frizington, and Aspatria, and the provision of clinic treatment, perhaps by a caravan, for a large part of the east of the county. Dr. Morison also presses for the energetic operation of the Housing (Rural Workers) Act of 1926 by the full coöperation of the county council with the local authorities.

Breconshire.

Dr. Herbert Davies records an epidemic of small-pox in the Brynmawr district. The first case was notified in the beginning of May, and 59 cases were notified during the year with no deaths. The epidemic was more severe in Monmouthshire and Glamorganshire. The county council subsidise the district nursing associations and in return the nurses, who also act as midwives, perform the duties of school nurse and health visitor. A scheme is in force whereby midwives attending cases more than three miles from their home are paid an allowance of 3*d*. per mile after the first three miles for each day of their attendance, but no payments were made under this scheme during the year. As in most districts the death-rate from respiratory diseases in 1927 was increased by the prevalence of influenza.

Aberdeen.

Dr. Harry J. Rae reports that the scheme begun in 1925 for the immunisation of children against diphtheria and scarlet fever has been continued with vigour. Up to the end of February about one-third of the school population, 8500 children, had been tested and 7000 of them actively immunised. As regards results, during the period mentioned 1333 cases of scarlet fever were notified. The cases notified included 21 of the tested children, in 7 of whom the disease appeared within a month of the last inoculation, while four others were discharged from hospital as not having had scarlet fever. The net result, therefore, was 10 mild cases of scarlet fever among the 7000 immunised children. During the same period 257 cases of diphtheria were notified, only two of whom had received preventive inoculations. Two separate outbreaks of milk-borne paratyphoid fever occurred, both in the Deer district. The first began in the end of May and caused about 32 cases in the burgh of Peterhead. The mother of the family, which carried out the work of the dairy farm, was found to be a carrier. The husband made application for compensation owing to loss of his work. The authorities did not think compensation could be legally made under Section 164 of the Public Health (Scotland) Act, 1897. The claim was ultimately settled by finding employment for the man under the road surveyor of the Deer district. In this outbreak the evidence pointed to the fact that the milk was infected on one occasion only. The second outbreak, also of paratyphoid B, occurred in November. The actual carrier in this case was not clearly demonstrated, and the milk appeared to have been infected on one or, at most, on two occasions.

There were 346 notifications of pneumonia. Institutional treatment is encouraged, and there is plenty of accommodation at the city hospital or at Woodend hospital. Removal is recommended up to the fourth day provided the patient's condition is good and there is no cardiac embarrassment. Many practitioners in the county favour domiciliary treatment, one objection to which is that the patients return to work too soon. In eight cases special nurses were supplied through the health department. Dr. Rae thinks that the extensive adoption of the Housing (Rural Workers) Act would do more to meet the housing shortage in the county than any preceding housing Act, and points out that this Act applies to burghal areas and to the dwellings of persons other than agricultural labourers. Routine inspection by the county veterinary inspector discovered 69 suspect cows, of which ten had tuberculosis of the udder.

Fife.

Dr. G. Pratt Yule draws attention to the steady decline, year by year, of both the deaths from and the notifications of tuberculosis. The tuberculosis officer, Dr. G. McGillivray, thinks that the risk of case-to-case infection in a family has been greatly lessened by education. Most of the cases in Fife come from one- and two-roomed houses. Nevertheless, out of 241 new cases of tubercle in 1927 only 14 were contacts. In 36 others some kind of a family history of tuberculosis was obtained, but none of "living in contact." In 191 cases there was no family history of tuberculosis. Some years ago the state of affairs was quite different, when windows were seldom opened and no precautions taken with regard to coughing or sneezing and the disposal of sputum. Kirkcaldy is the only one of the four districts which continues to add to its housing programme. Dunfermline has discontinued owing to the state of the coal trade. Cupar and St. Andrews have contented themselves with subsidising private enterprise. All the four districts have adopted approved schemes under the Housing (Rural Workers) Act, but only four applications under this Act were received in 1927. There are nearly 6000 dairy cows in the county, and in 1927, the first completed year of regular inspection, was carried through by the county veterinary surgeon, Mr. R. G. Anderson.

MENTAL HOSPITAL REPORTS.

THE *West Sussex County Mental Hospital, Graylingwell*, near *Chichester*, has had an unusual influx of patients and is now 47 over the statutory accommodation, which is for 800. For the moment the most urgent need is for female beds, but during the last few months the admissions have been chiefly males. Of the 153 admissions 48 were aged 60 or more, and many of them were quite hopeless. Nevertheless there was a recovery-rate of 30·7 per cent. The general health was good, except for a mild epidemic of influenza, two cases of chicken-pox, and three of typhoid. The death-rate was 7·54 per cent. Dances and cinema performances take place weekly and a wireless apparatus is to be installed. Eight nurses and three attendants obtained their M.P.A. certificate during the year. Thirty of the 37 pages of the report are purely statistical.

The *Dorset County Mental Hospital* had 880 patients on the books at the end of the financial year and is considering plans for extension, although this figure shows a small diminution in the number of women patients. The recovery-rate is 48·22 per cent., rising to 68 per cent. if cases "discharged relieved" are included. The death-rate was 6·47 per cent. The general health was very good and the tuberculosis incidence has been halved. Although there are typhoid carriers in the hospital there has been no epidemic sickness of any kind except influenza in the spring. The laboratory has carried out over a thousand routine investigations and has also initiated research into the acetic anhydride or Boltz test and Buscaino's silver nitrate reaction. A "leucocytic survey" was made of all patients towards the end of the year, with a view to detecting focal sepsis. Acetonuria was found to have no significance in mental disease. Of 13 cases of general paralysis treated with tryparsamide, three have gone back to work, three are much improved, and four have died. Seven showed much mental inprovement. Occupational therapy is a new departure in this hospital and is already producing most excellent results; the department is self-supporting, for the handicraft work finds a ready sale. The out-patient clinic is held weekly at the Dorset County Hospital. A solarium for the men patients has been completed and various other alterations have been carried out in order to bring the hospital up to modern standards. The operating theatre is now in use. Patients are allowed to wear their own clothes and two wards on each side have open doors. Seventy-seven men and 14 women have full parole. Eight more nurses obtained the M.P.A. certificate during the year, and it is interesting to note that 28 members of the staff have more than 21 years' service to their credit.

The *Devon County Mental Hospital* records, in an illustrated report, a year of activity among its 1211 patients. To relieve congestion, 41 chronic harmless patients were removed to the care of local authorities. The recovery-rate was 36·65 per cent., but the figure for the private patients alone was 47 per cent., The death-rate was 9 per cent., the cause being verified by autopsy in 67·8 per cent. of cases. There has been a steady increase in the routine work of the laboratory, and 1860 investigations are listed. Blood films of patients who have had ultra-violet light treatment are being investigated. The consulting surgeon performed 21 operations and the dental surgeon examined 453 patients, including all new admissions. The ophthalmic surgeon saw 60 patients and prescribed glasses for 36. Definite benefit is being obtained from the ultra-violet ray installation. Five men with general paralysis were treated by induced malaria and three of them were discharged; one became worse. The out-patient clinic in Exeter treated 34 patients during the year. The new fruit garden supplied patients with 640 lb. of raspberries. Eighty-nine patients have had daily parole within the estate and 57 more have been allowed into the village and on walks. There has been no abuse of the privileges. The Hospital Fire Brigade won a prize at the National Fire Brigades' Association demonstration at Exmouth. The list of entertainments for patients occupies three and a half pages of small type; 15 of the 25 cricket matches were won by the hospital eleven. The handicrafts occupy a very large number of patients. Every effort is made to impress on probationer nurses that they come to the hospital to be taught and must go through a course of training and examinations just as general nurses do; 31·8 per cent. now have their M.P.A. certificate.

The *Stafford Mental Hospitals Board* houses just over a thousand patients at its Stafford Hospital, 943 at Burntwood, and 1134 at Cheddleton.—At *Stafford* the recovery-rate was 40 per cent. and the death-rate 7·62 per cent. The deficiency in sleeping accommodation has been partially relieved by the completion of a new annexe for tuberculous male patients and the use of the Isolation Hospital for men convalescents. A reception hospital is planned. The laboratory research has been hindered by the illness of one of the medical officers, but routine work goes on as usual and investigation has been continued into the usefulness of venom hæmolysis as a means of diagnosis. Patients are sent home on trial and have parole in the grounds, but not beyond. Forty-six male and 10 female nurses are certificated or registered. Ultra-violet ray treatment is giving good results.—At *Burntwood* the recovery-rate was 24·34 per cent. and the death-rate 9·63 per cent. The hospital is overcrowded and there is urgent need for an admission block. There were 88 cases of influenza, three of typhoid fever, and two fatal cases of dysentery, the source of which has been sought in vain. Vita-glass has been fitted in the men's sun room and has proved well worth the expense. Violet-ray and continuous bath apparatus are to be provided. Trial and parole are allowed to a number of patients. Forty-nine nurses are certificated or registered.—At *Cheddleton* there is the same overcrowding and there is urgent need for verandahs, X ray apparatus, and admission and convalescent blocks. The increase in the number of cases of dementia præcox and general paralysis continues. Malarial treatment for the latter is giving great satisfaction. Fourteen patients died of tuberculosis, although only one could be diagnosed on admission. Dysentery continues to cause anxiety, and careful search has not revealed the source of infection. The medical superintendent speaks trenchantly of the need for more nurses and of the difficulties of work in an out-of-date building with inadequate financial resources. Parole is granted to a number of patients, and three wards are administered on the open-door system. Twenty-six per cent. of the women and 60 per cent. of the men nurses are certificated or registered. The staff includes a visiting orthopædic sister, an electro-therapeutic sister, and a schoolmistress.

The *Joint Counties Mental Hospital at Carmarthen* housed 655 patients at the end of 1927, and had a recovery-rate for the year of 27·9 per cent. The death-rate was 11·39 per cent. One baby was born in hospital, and the mother has since recovered. There was a heavy epidemic of influenza in the spring and 21 cases of diarrhœa and 6 of tuberculosis were notified. The dental surgeon visited weekly and examined 200 patients. He found very little caries, but a good deal of gum trouble. The hospital lacks a number of facilities for treatment commonly regarded nowadays as indispensable. For instance, there is no electric-supply and, consequently, X rays, violet rays, and electric baths are impossible. The water-supply is inadequate, but the sewage has now been connected up with the town drains. The visiting Commissioners complain of the state of the sanitary annexes, of the darkness of the workroom and kitchen, of carelessness in storing poisons, and in keeping clinical records, and of the absence of verandahs, and of any attempt to keep the patients either employed or amused. They remark: "There is an excellent pathological laboratory which has not been used for some years. . . . We hope that due regard will be paid . . . to the desirability of appointing a medical man with some knowledge, experience, and interest in this field of work."

At the *Glamorgan County Mental Hospital* at *Bridgend* there is overcrowding to the extent of 133 on the male side, and plans have been approved for a new reception block and other buildings. There were 1933 patients in residence at the end of 1927. The recovery-rate for the year was 31·1 per cent., nd the death-rate 8·9 per cent. General paralysis ccounted for most of the deaths, but disease of the heart and blood-vessels came next in order. The cause of death was verified by autopsy in 80 out of the 172 cases. A baby was born and the mother recovered. The general health was good, save for influenza and three cases of dysentery. The surgeon was not called on for any major operation, but the dental surgeon saw over 400 patients and performed 1408 extractions under local anæsthesia. Seventy patients were sent out on trial, ten with money allow-nces, and a good deal of parole is allowed on the nale side, but none on the female. Twenty-one urses gained their M.P.A. certificate during the ear.

The *Monmouthshire Mental Hospital* at *Aberga-nny* had 1158 patients at the end of 1927. The recovery-rate was 36 per cent. and the death-rate 5·2 per cent.—the lowest ever recorded at this hospital. The rate among the women was as low as 3·9 per cent. This speaks well for the efforts made in a hospital which, as a building, lacks many modern amenities. Central heating has been installed and one of the wards on each side is being converted into an admission ward with an open verandah nd a hydrotherapy room. The general health was ood except for influenza, and the institution is now ree from dysentery. The visiting surgeon performed ree operations during the year and the dental rgeon visited weekly. A number of patients have role, and efforts are made to find occupation for of them. Three more nurses have obtained their tificate.

he *Down County Mental Hospital, Downpatrick,* strates its report with many photographs of the dings. There were 756 patients on the books at the end of the year. The recovery-rate was 46·2 per cent. and the death-rate 6·9 per cent. There were 44 vacancies, accommodation having been increased by the new nurses' quarters. The farm continues to be a pecuniary asset as well as providing excellent occupation for the patients, who are mainly drawn from an agricultural population. The increase in the number of entertainments and recreations continues, and the medical staff investigate cases thoroughly and individually. The more elaborate laboratory work is carried out in Belfast and London; last year an epidemic was averted by the prompt recognition of a "carrier" colitis. More than half the patients are usefully employed. About a hundred men go outside the walls every day and as many women once a week. The dental surgeon visits weekly, and there are physicians and surgeons on the consulting staff. Nine more nurses have gained their certificate, bringing the total to 51.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 8TH, 1928.

Notifications.—The following cases of infectious isease were notified during the week:—Small-pox, 23 (last week, 102); scarlet fever, 1790; diphtheria, 31; enteric fever, 108 (last week, 122); pneumonia, 38; puerperal fever, 38; puerperal pyrexia, 102; rebro-spinal fever, 3; acute poliomyelitis, 17; cephalitis lethargica, 29; continued fever, 3; sentery, 8; ophthalmia neonatorum, 102. No of cholera, plague, or typhus fever was notified ing the week.

The following counties each notified 3 or more cases of enteric fever:—London, 23; Devon, 3; Essex, 12 (of which Colchester 6); Hertford, 3; Lancaster, 6; Middlesex, 5; Southampton, 3; Surrey, 6; Sussex East, 4; Yorks West Riding, 3; Denbigh, 3. The total of 108 includes 39 cases of paratyphoid fever, of which 13 were notified in London and 5 in Surrey.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Sept. 11th–12th was as follows:—Small-pox, 9 under treatment, 2 under observation; scarlet fever, 1552; diphtheria, 1444; enteric fever, 105; measles, 120; whooping-cough, 247; puerperal fever, 14 (plus 7 babies); encephalitis lethargica, 72; poliomyelitis, 2; "other diseases," 22. At St. Margaret's Hospital there were 17 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 4 (0) from enteric fever, 14 (2) from measles, 5 (0) from scarlet fever, 17 (6) from whooping-cough, 17 (3) from diphtheria, 120 (39) from diarrhœa and enteritis under two years, and 18 (2) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever were reported from Bristol, Stockport, Burnley, Newcastle-on-Tyne, and Tynemouth. Of the 12 fatal cases of measles 3 were reported from Birmingham, Belfast reporting 4 in the same week. There was a large increase in the number of deaths from diarrhœa, of which Liverpool reported 10; Birmingham, 9; Manchester Leeds, and Newcastle-on-Tyne 5 each; and West Ham, 4; while Glasgow and Dublin reported 10 and 6 respectively. The number of stillbirths registered during the week was 263 in the great towns (corresponding to a rate of 89 per 1000 births), including 60 in London.

INFECTIOUS DISEASE IN NORTHERN IRELAND.—According to a return just issued by the General Register Office in Belfast (H.M. Stationery Office, 1s.) the following cases of infectious disease were notified to the Ministry of Home Affairs during the second quarter of 1928—namely:—Enteric fever, 99 (70); typhus, 4 (4); small-pox, 0 (0); scarlet fever, 782 (458); diphtheria, 254 (123); pneumonia, 50 (2); cerebro-spinal meningitis, 3 (3); encephalitis lethargica, 1 (1); erysipelas, 41 (19); tuberculosis, 280 (262); measles, 3 (0); chicken-pox, 70 (0); puerperal fever, 10 (8); ophthalmia neonatorum, 4 (4); membranous croup, 1 (1). The figures in parentheses are for the County Borough of Belfast. It should be remembered that tuberculosis is not notifiable in many districts, that measles is only notifiable in Bangor, and chicken-pox only in Bangor and a few small districts. The returns for cerebro-spinal meningitis and encephalitis lethargica are also incomplete.

DONATIONS AND BEQUESTS.—Mr. William Horne Cook, Edinburgh, left nearly £3000 to charities, including £1000 to the Royal Edinburgh Hospital for Sick Children, of which he had acted as treasurer, and £500 each to Muirfield Convalescent Home for Sick Children and the Edinburgh Royal Infirmary.—Mr. Robert Hilder, Threshall Priory, Stansted, Essex, and of the London Stock Exchange, left, besides other bequests, £5000 to St Mary's Hospital, Paddington, as an endowment for five beds in memory of his late wife's brother, Richard Mynors, formerly chief assistant to Sir William Broadbent at that hospital, and £5000 to the Bishops Stortford Hospital.—Mr. James Walker Oxley, retired banker, of Westwood, Headingley, Leeds, left £5000 4 per cent. Preference Stock of the L.M. & S. Railway each to the Leeds Public Dispensary, the Leeds Tradesmen's Benevolent Institution, and the Leeds District Nursing Fund for the Sick Poor.—Miss Ellen Davis, of Highfield Lodge, Lincoln, left £1000 to the Lincoln County Hospital, Lincoln.—Mrs. Caroline Ashley Smith, of Onslow-gardens, South Kensington, left £500 each to the Ramsgate General Hospital and the Princess Louise Hospital for Children, Kensington, W.—Leaving over £47,000, Dr. Alfred Charles Augustus Packman, of Grove House, Rochester, bequeathed the bulk of his estate in trust for his brothers and sisters, and on the death of the survivor of them between the Royal Medical Benevolent Fund and the West Riding of Yorkshire Medical Charity.—Miss Martha Mills, of Nottingham, left, among other bequests, £1000 to the Nottingham General Hospital, for the endowment of a bed in memory of her brother-in-law, Morris Weisblum; £100 to Dr. Barnardo's Homes; £50 to the Lord Roberts Memorial Workshops, London; £50 to St. Dunstan's Institute for Blinded Soldiers and Sailors; £50 to Ellersley House, Nottingham, Home for Paralysed Soldiers and Sailors; £50 to Lord Mayor Treloar's Homes for Crippled Children; and £100 to the Nottingham General Hospital.

Reviews and Notices of Books.

BRAIN AND MIND,

Or the Nervous System of Man. By R. J. A. BERRY, M.D., F.R.C.S., F.R.S. Edin., Dean of the Faculty of Medicine and Professor of Anatomy in the University of Melbourne, &c. New York: The Macmillan Company. 1928. Pp. 608. 31*s.* 6*d.*

THE appearance of Prof. R. J. A. Berry's interesting and provocative book is doubtless a sign of the times; it proceeds logically from the simple to the complex, from structure to function, from the physiological to the psychical; it insists on psychology as a department of biology, on neuronic insufficiency as the necessary antecedent of mental disease. In his opening sentences Prof. Berry indicates his personal standpoint in the clearest fashion: "it is not uncommon to find the human mind spoken of as though it were something which had no physical basis whatever, but was the result of a Psyche or soul, whereas the truth is that all mental phenomena are strictly dependable on physical construction, and that the elementary basis of such construction is always the neuron or nerve cell." Thus is the gauntlet thrown down in challenging fashion; no neuron, no mind, is the author's battle-cry. The reception of this finely written and closely reasoned thesis by the individual reader's mind will no doubt depend on the latter's preconceptions and mental training; he may welcome it as elaborating in a convincing way what he has felt all along to be the only rational manner of envisaging the facts; or, on the other hand, he may remain coldly unimpressed, satisfied that no amount of objective correlation of cerebral structure with psychical manifestation will explain the essential difference of the two orders of things, psychical and physical.

It is well, none the less, that the materialistic viewpoint (the epithet may be used in this connexion without misunderstanding) should be adequately stated, and that the body of evidence which can be advanced in its support should be properly marshalled and duly evaluated. That a professor of anatomy should do this for us cannot surprise those who are acquainted with Prof. Berry's previous work and research; after all, why should he not? No one whose knowledge of intimate neural structure is as profound as his can fail to see that by itself this marvellous complexity is nothing; its meaning, its purpose, its activity, form the fascination never absent from pure morphology. The only material physical distinction between man and the lower animals is that he possesses about three times as many cerebral neurons as does any other animal; and that his increased mentality is solely due to this cause cannot seriously be called in question. On the pathological side, the conclusion is that all the abnormalities of neural function, whether currently they are held to belong to the domain of psychopathology, psychiatry, or neurology, fall into four groups—absence, diminution, perversion, or exaggeration, respectively, of the functions of the three great structural divisions of the central nervous system—viz., receptor, internuncial, and effector neurons.

Straightforward as is Prof. Berry's exposition of his thesis, and impressive as are his numerous illustrations taken from clinical medicine, we should have been glad to have his views on the possible influence of function on structure; assuming that such a process is not only conceivable but on occasion actual, we should have been interested in his explanation of its bearing on his own line of argument. There must surely be interplay between vitalism and structuralism; in an appreciative preface written by Dr. Foster Kennedy, of New York, he insists that nurture is requisite, as well as nature, if the neuron is to flower; and we may recall the dictum of the veteran Prof. von Monakow, that every psychical process presents certainly a physiological effect in the brain, whether we will or not.

THE CLINICAL EXAMINATION OF THE NERVOUS SYSTEM.

Fourth edition. By G. H. MONRAD-KROHN, M.D., F.R.C.P., Professor of Medicine in the Royal Frederick University, Oslo, &c. With a foreword by T. GRAINGER STEWART, M.D., F.R.C.P., Physician to the National Hospital, Queen-square, &c. London: H. K. Lewis and Co., Ltd. 1928. Pp. 209. 7*s.* 6*d.*

WE have reviewed Prof. Monrad-Krohn's handbook on previous occasions, and compliment its author on the appearance of a fourth edition—a sure sign of appreciation and of its intrinsic merits. Comparatively little change has been made in the latest edition. Two or three pages on the interpretation of X ray photographs of the skull have been added. The book contains much useful and practical information in small compass, and deserves to be still more widely known.

THE PRINCIPLES AND PRACTICE OF OBSTETRICS.

Fifth edition. By JOSEPH B. DELEE, A.M., M.D., Professor of Obstetrics at the Northwestern University Medical School; Obstetrician to the Chicago Lying-in Hospital and Dispensary, and to the Mercy Hospital, &c. London and Philadelphia: W. B. Saunders Company. 1928. Pp. 1140. 55*s.*

THE fourth edition of this well-known text-book of obstetrics was published at the end of 1924, and even in this short space of time extensive alterations have been found necessary in both text and illustrations. The book is very complete and will be of value to those who take more than a superficial interest in this branch of medicine. The views of Dr. DeLee on pregnancy and labour are well known in this country. There are probably few who agree with him that more than half the pregnancies which occur in a civilised state are pathological; in spite of this view, however, he does not advocate excessive interference with the normal course of nature. The scientific side of the subject is dealt with fully, and hundreds of references are given to the various original papers from which quotations are made. In dealing with treatment, the author discusses the measures which have from time to time been advocated, and then describes his own practice. Midwifery under adverse conditions does not receive the amount of attention that might be expected in a book of this size.

In the previous edition Dr. DeLee was full of praise for the transperitoneal cervical Cæsarean operation, and we are interested to note that his further experience confirms his original opinion. The operation has now been performed at the Chicago Lying-in Hospital 620 times with six deaths. In 1924 it had been performed 266 times, so that this one hospital alone apparently has to deal with nearly 100 cases a year which require Cæsarean section. Thirteen excellent illustrations show the various stages of the operation. Catgut only is used for the uterine sutures. In both the classical and the low operation no attempt seems to be made to produce a thick scar in the uterus; it would be interesting to know how often the scar stretches. In the chapter on placenta prævia no mention is made of Willett's scalp forceps now used with great success in this country. It is not easy to discover the author's views on the treatment of eclampsia. He seems to approve of both the operative and the conservative methods under different conditions. If the conservative method is chosen, he advises that labour be terminated as soon as possible—i.e., as soon as the cervix is fully dilated. "If the head is engaged, forceps; if not, version is chosen." He approves of venesection, but considers eliminative measures to be useless. Chloroform should never be used to produce anæsthesia, and in his opinion ethylene is to be preferred to ether. He mentions that veratrone was recommended for the treatment of eclampsia in 1859, and places this form of treatment in the same category as amputation of the breasts. The chapter on forceps is most informative. In it the evolution of the modern instruments is discussed in detail. Dr. DeLee is not as enthusiastic as are most continental writers about the value of the Kjelland forceps.

This book has established itself as one of the leading works on obstetrics in the world. It is too large for the junior student, but for those engaged in the teaching of midwifery, and for those reading for higher examinations, it is invaluable. We would have preferred the weight to be less than five and a quarter pounds, but the illustrations and printing are beyond criticism.

A SHORT HISTORY OF MEDICINE.

Introducing Medical Principles to Students and Non-medical Readers. By CHARLES SINGER, M.D., D.Litt., F.R.C.P. Oxford: The Clarendon Press: London: Humphrey Milford, Oxford University Press. 1928. Pp. 368. 7*s.* 6*d.*

Dr. Singer has here attempted to trace the process by which medicine had its source in a number of isolated sciences, united into one stream in the eighteenth century with the rise of the scientific method of inductive reasoning, and divided in our own age into an ever-widening delta of ever-multiplying specialties. His aim is, by treating of medical ideas rather than of medical men, principles rather than details of practice, to indicate the Entelechy—or soul—underlying the bewildering network of modern medical science. He fears lest facts be piled up too fast for the philosophers to rationalise them, and pleads for the understanding of medicine as a whole and of its purpose in human affairs. The story of the infancy of medicine is kept within very strict bounds, and more than half the book is devoted to its modern developments, the beginnings of which Dr. Singer sees at about the year 1825, which he takes as the start of his Period of Scientific Subdivision. He traces in detail the development of the ideas which are now expressed in forms so much a commonplace of medical life that the realisation of their comparatively recent origin comes as a surprise. He shows, for instance, how the experimental foundations of modern medicine were laid by the work of the great physiologists Johannes Müller, Claude Bernard, and Karl Ludwig less than a hundred years ago. The cell theory and the study of cellular pathology did not exist before the work of Bichat at about the time of the French Revolution, and other keystones of medical science such as the germ theory, anæsthesia, and immunity are, of course, still more modern. The conquest of the tropics, the growing enlightenment in the field of psychology, the revolution in nursing, and the latest advances in pharmacology bring the absorbing story down to the present day.

The book is compact and well balanced, and is replete with charts and the interesting and recondite illustrations upon which the author is an authority. The Oxford fount and the rich paper make the volume a delight to the touch and eye. No one requiring a summary of the position of medical science, and its place in modern life, could wish for a more lucid author or a more favourable vehicle.

AIDS TO ORGANIC CHEMISTRY.

By STANLEY F. SMITH. London: Baillière, Tindall and Cox. 1928. Pp. 114. 3*s.*

Mr. Smith has taken the course of organic chemistry at St. Thomas's Hospital Medical School as the basis of a little book intended to help medical and science students in reviewing a subject which they often find to be elusive. Prof. R. H. A. Plimmer, whose course has thus been annotated, points out in a prefatory note where Mr. Smith has been able to bridge the gaps inevitably left in the subject owing to the short time allotted to it. The notes and formulæ are well arranged and indexed, and the book should prove useful for its modest purpose.

OPERATIVE SURGERY.

Third edition. By J. SHELTON HORSLEY, M.D., F.A.C.S., Surgeon, St. Elizabeth's Hospital, Richmond, Va. London: Henry Kimpton. 1928. Pp. 893. 63*s.*

THIS book has a recognised place in contemporary surgical literature. It is built up on the usual lines, but certain subjects receive more prominence than is customary. Much space is devoted to plastic work, and the account of this branch of surgery is very good. The surgery of the vascular system is also considered fully, and is a subject upon which the author is well qualified to speak with authority. His own methods of pyloroplasty and of performing the Billroth I. operation are described, and his reasons for recommending them. We notice a certain unevenness, not in the presentation of the subject matter, but in the perception of the true value of different surgical procedures. For instance, quite detailed and illustrated accounts are given of Trendelenburg's operation for removal of a pulmonary embolus, after which no patient has survived more than a few days, and of Coffey's operation for excision of the head of the pancreas which has not yet been performed in man; on the other hand, the details of much more ordinary procedures, such as the removal of cervical ribs or hypophysectomy, are too briefly dismissed. On the whole, however, a high standard is maintained, and the book should retain its popularity.

DENTAL MEDICINE.

By F. W. BRODERICK, M.R.C.S., L.R.C.P., L.D.S. Eng., Hon. Dental Surgeon to the National Sanatorium for Diseases of the Chest, Bournemouth. London: Wm. Heinemann (Medical Books) Ltd. 1928. Pp. 364. 21*s.*

THE author of this book writes with deep sincerity and has assembled an enormous amount of material in support of his thesis, which is, very briefly, that the predominant underlying cause of dental caries is acidosis, whilst pyorrhœa alveolaris is the result of an attempt to compensate alkalosis. In support of this belief the book contains chapters dealing in considerable detail with such branches of physiology as the regulation of the hydrogen-ion concentration of the blood, the glands of internal secretion, calcium metabolism, and the chemistry and physics of the saliva. It is clear that Mr. Broderick's study of the literature on these subjects has been extensive, but it would appear that this study was not undertaken with an unbiased mind, for his numerous quotations are almost invariably selected with a view to supporting hypotheses which, in the opinion of many distinguished physiologists, are at present quite unproven. It would be unfair to so sincere and industrious a writer to dismiss his theories in silence, but it would be equally unfair to suggest that his book as it stands is a fitting one to be read and accepted by the uninstructed reader, especially if such a reader has had no more thorough medical education than is received by the average dental surgeon. For it may be said that nearly all Mr. Broderick's main conclusions could, by an equally careful selection from the published work of various reputable observers, be disproved or shown to be without a sound basis of fact. Any author is, of course, free to express his theories in writing, but to publish a book entitled "Dental Medicine" is a challenge to criticism, in that the perusers of such a book may expect from its title to find in it a reasoned exposition of the established facts concerned in the subject. We have been unable to find any important series of observations in this volume made by the author himself in support of his beliefs, and it seems fair to suggest that he would have done far more on behalf of the theories which he sponsors if he had produced a reasonable series of some hundreds of observations on his own patients, carried out with unimpeachable biochemical technique, with a view to producing actual data to support his conviction that the acid-base equilibrium of the blood is disturbed in a specific manner in each of the two great dental diseases.

FOLKLORE OF THE TEETH.

By LEO KANNER, M.D., Yankton State Hospital, South Dakota. New York: The Macmillan Company. 1928. Pp. 316. 17*s*.

THIS book appeals to a wider circle than the professional reader, doctor, or dentist; it contains a surprising amount of information, bears evidence of reading and research, and is instructive as well as interesting. The contents are arranged in the following sections: number, shape, and eruption; popular dental hygiene; toothache and its cure; artificial deformation of the teeth; teeth as used outside the oral cavity. An appendix contains a bibliography and a glossary. Shakespeare would seem to have been one of the first to put in print the information, which must have been, even in his day, as old as the hills, that not even a philosopher can endure toothache patiently, while Burns cursed his affliction in robust Scottish verse. The chapter on plant treatment of toothache is dull reading, but it could not have been omitted from a work of this kind, and the rest of the book contains on almost every page interesting items of dental folklore. The golden tooth of the Silesian boy seems to have deceived nearly everyone save a canny Scot!

Details are given of the martyrdom of St. Apollonia, whose executioners, to punish the boldness of her confession, beat out her teeth and who thereafter became the patron saint of toothache; there is a frontispiece of the saint, reproduced from the painting by Dolci, at Rome. We do not observe any direct mention of soot as a popular tooth-powder. Harold Bluetooth is mentioned; one supposes him to have been the possessor of a dead incisor; but we miss Jenny Greenteeth. It may be that the latter is pure nursemaid fiction; but such was the name of the presiding genius of a certain pool in front of a rectory house on the Welsh border 60 years ago. When the children were allowed to fish in the said pool, with a "wurrm," they were always cautioned to beware of Jenny Greenteeth. In our day the myth was somewhat exploded, for an uncle, on one of these fishing excursions, had caught Jenny Greenteeth, who turned out to be a large eel. It is possible that, to the rustic mind, she may have represented the ghostly spirit of a previous rector, who chose the pool in front of his own door as the readiest mode of committing suicide. We cannot tell.

BIONOMICS.

Animal Ecology. By C. ELTON. London: Sidgewick and Jackson. Pp. 207. 10*s*. 6*d*.

ŒCOLOGY (for there is no reason for adopting the Americanised form of what was originally a German word) is the study of the relationships of animals and plants to one another and to their inorganic surroundings. Hitherto it has been mostly studied by botanists; this is indeed the first book on animal œcology to be published in this country and one of less than half a dozen written in English. The subject is one of much interest for its own sake, and its medical and hygienic implications are considerable. The control of many parasitic diseases depends on a knowledge of the habits, life-histories, food, and enemies of the lower animals which intervene in the cycles of infection; an œcological knowledge of rats, mosquitoes, and tsetse-flies is as important as full systematic information. Mr. Elton has himself made some important contributions (*Jour. Hyg.*, 1925, xxiv., 138) to the study of the periodic waves of excessive abundance which come over animals like lemmings, hares, and voles and end generally in epidemics, and has, in this book, provided an interesting and stimulating introduction to the whole subject.

JOURNALS.

AMERICAN REVIEW OF TUBERCULOSIS. April–June, 1928.—Dr. Henry D. Chadwick discusses the X ray and clinical diagnosis of pulmonary tuberculosis in children. He draws attention to the confusion that arises when juvenile and adult types of pulmonary tuberculosis are not separated into two distinct groups. The diagnosis of the juvenile type depends on a consideration of factors, the most important of which are radiographic evidence of calcified hilar glands and nodules in the lungs, the intradermal tuberculin test, and a history of exposure to infection. Physical signs are of less importance. None can be considered pathognomonic though interscapular dullness is due in some cases to muscular spasm, the reflex effect of inflamed mediastinal lymph glands. Auscultation and percussion are chiefly of value in so far as they determine the presence or absence of other disease. Calcified glands and nodules are definite evidence of tuberculous infection. In the absence of evidence of calcification enlarged or dense hilar shadows may be due to early infection, in which case skin tests and a study of symptoms may supply further evidence of disease and indicate the need for careful supervision and treatment.—A statistical study of the results of artificial pneumothorax treatment at the Locomis Sanatorium during a period of 14 years is supplied by Dr. Andrew Peters. In a series of 273 patients no cases of gas embolism or pleural shock were encountered. Of all patients in whom any pneumothorax at all was induced, 42 per cent. were living at the end of 2 to 14 years, and 24 per cent. were reported in satisfactory condition. The end-results in the pneumothorax group were nearly twice as good as those obtained when no pneumothorax was possible. When a satisfactory collapse of the lung was secured tubercle bacilli disappeared from the sputum in 72 per cent. of the cases and over 60 per cent. were alive at the end of the period quoted.—Dr. F. M. Pottenger contributes a paper on factors fundamental to healing in tuberculosis. Primary infection is met by a non-specific response by the body cells. A reaction which is "largely non-inflammatory" results in the formation of tubercles at the points of attack. When allergy has been established as the result of the absorption of tuberculous products at the source of infection the reaction of the body cells towards bacilli and bacillary protein changes. If reinfection occurs inflammation and exudation dominate the process. The response is now specific. Primary infection is an acute disease; a secondary infection, even when the result is fatal, is marked by a chronic course. The pneumonic exudation which accompanies the spread of tuberculosis in lungs is the result of an allergic reaction. Such exudate may completely resolve and leave no scar. This is the explanation of the remarkable clearing occasionally noted in a series of comparable skiagrams of a patient's chest during the course of a disease whose early spread was shown by extensive areas of mottled shadows in the lung fields. Dr. Pottenger illustrates this by a series of plates which demonstrate very clearly how exudation may be absorbed and cavities close as the result of natural healing. This article might well be read as an introduction to that on Tissue Reaction in Tuberculosis by Dr. R. S. Cunningham, and the analysis of Modern Concepts in the Pathology of Tuberculosis contributed by Dr. Max Pinner.

Dr. Charles Terry's book on "The Opium Problem," which was reviewed in THE LANCET last week, can be obtained in England through Messrs. Baillière, Tindall and Cox, 8, Henrietta-street, London, W.C.2.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 22, 1928.

THE IMPROVISED KNEE-JOINT.

The operation of arthroplasty of the knee, or the replacement of a joint that has been lost through disease or surgical operation, has taken a long time to make progress in the favour of surgeons. More than a quarter of a century has passed since Murphy, of Chicago, whom Sir Berkeley Moynihan has described as one of the supremely great men in medicine through all generations, succeeded in making useful new joints in the place of pre-existing bony ankyloses. Other surgeons have been slow in following up his methods, until Putti, of Bologna, reopened the subject soon after the war, and showed a number of remarkably successful results from this operation. Even now only a small number of surgeons seem to be adopting the technique, among them being Prof. Hey Groves, Dr. W. R. MacAusland, and in the last few years Dr. F. H. Albee.

The reasons for a cautious advance are not far to seek. Interference with the joints of the upper limb when properly performed often give excellent results, but the conditions are very different in the lower limb, which has to bear the weight of the body besides taking a large part in its propulsion. The knee is the joint which owes its stability least to the shape of the ends of the bones which enter into it and most to the surrounding muscles, the ligamentous and cartilaginous apparatus. Hence it is obvious that the mere re-forming of bone-ends is not likely to produce a useful joint, while to attempt to make new ligaments such as normally exist inside as well as around the site of the articulation would be a hopeless task. Long atrophied muscles, moreover, do not seem to offer good hopes for a secure control of the joint. Add to this the fact that the newly made knee-joint must bear the whole body-weight at least, and often much more than that, and it is not surprising that some of the most enterprising and skilful surgeons have shrunk from attempting the operation. Besides anatomical and mechanical objections, there are others of a functional nature. The patient who has a firm bony or even fibrous ankylosis in a good position is already in the possession of an exceedingly useful, strong, and painless limb. It is true that he finds it awkward in public conveyances, supposing that he is so fortunate as to secure a seat, and in the balconies of theatres. He is handicapped in the pursuit of the more athletic sports, and riding on horseback is practically forbidden to him. When such a patient is warned that the operation is a severe one, not without danger to limb and even to life, and that the after-treatment is long, likely to be painful, and sure to call severely upon his powers of perseverance and endurance, also that complete restoration of function cannot be guaranteed, he may well decide to leave things as they are. Moreover, the workman whose trade may require him to flex his knee-joint to its full normal extent has little to hope for from arthroplasty, since even passive flexion beyond a right angle is rarely possible after the operation.

There are, however, exceptional cases in which the hope of regaining a useful knee-joint outweighs other considerations. Such, for instance, was a cavalry officer whose future career depended on his being able to ride; he formed one of Prof. Putti's most brilliant successes. Surgeons who desire to be in a position to help such cases should study a recent article by Albee.[1] He supplies valuable statistical information of results of operations by various surgeons and describes a modification of technique which has given good results in his hands. This modification is ingenious, resulting from his observation of certain defects in the remote results of some of Murphy's cases. Supposing that the wound has run an aseptic course—and no surgeon whose technique is not reliable in this respect should dream of attempting arthroplasty—the chief causes of functional failure are (1) deficient range of flexion and extension, and (2) too great lateral laxity allowing deviation of the leg into genu valgum or genu varum. With the view of preventing lateral instability, which he thinks is a more common cause of failure than lack of flexion, Albee substitutes a wedge-shaped for a rounded articular surface of the femur, making a closely corresponding surface on the head of the tibia. Mechanically this is a sound theory, for, as Albee says, "weight-bearing forces the apex of the wedge-shaped end of the femur so firmly into the tibia that the danger of lateral instability is practically eliminated." There is no reason to doubt that this is true also in practice, but the conditions which Albee postulates as necessary for the lateral security of the joint seem likely to hinder flexion. He insists that each of the two faces of the wedge, which are to lie at an angle of 120° with each other, should be plane, a form which is not likely to allow much angular antero-posterior movement, unless there is great laxity of soft parts. This difficulty does not arise when the rounded shape of the bone ends is adopted. It must be admitted that the photographs reproduced give no indication that his technique has led to restriction of antero-posterior movements of a degree to prevent a useful amount of flexion. All operators are agreed that bony ankylosis of the knee is more suitable for arthroplasty than fibrous. The difference is probably due largely to the fact that among cases of fibrous ankylosis are included all cases of healed tubercle. Yet there seems no theoretical reason why a tuberculous knee in which the disease has long ceased to exist should not afford as good a result as one with osseous ankylosis due to an acute non-tuberculous infection. Even with modern means of examination such as X rays, however, it may not be possible to determine beforehand whether the inflammatory process is completely organised or only quiescent. But when a knee-joint has been successfully excised for tubercle it is probable that all diseased tissue has been removed, and the subject of such an operation might be given a new joint if he finds his disability distressing, without fear of stirring up a latent infection. Albee reports a most satisfactory result of arthroplasty in a knee formerly tuberculous. He adds a useful hint as to the choice of cases. Patients who are neurotic, unstable, and timorous are not likely to be such good subjects for arthroplasty as the bold and calmly hopeful who have shown pluck under previous sufferings and perseverance in making the best of their disabilities. Convalescence is a tedious affair, and the final result depends largely on the prolonged coöperation of the patient.

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[1] Original Features in Arthroplasty of the Knee with Improved Prognosis. By Fred. H. Albee, M.D., F.A.C.S., Surgery, Gynecology, and Obstetrics, September, 1928, p. 312.

THE NATURE OF THE ROUS TUMOUR.

The relationship of the filterable tumours of the fowl to mammalian neoplasms is one of the burning questions of cancer research at the present time. Until recently many pathologists were inclined to consider these fowl tumours as a disease sui generis, while some authorities even classified them as infective granulomata. Any observation which tends to establish an essential similarity or dissimilarity between these tumours and mammalian neoplasms is therefore of importance. Two years ago Prof. S. Russ and Mr. G. M. Scott published in our columns [1] the observation that the Rous tumour when irradiated in vitro was extremely resistant to the destructive action of X rays as compared with mammalian tumours. The same resistance was exhibited by a cell-free filtrate of the Rous tumour, which contains the causative agent of this growth. If the causative agent is resistant to irradiation one would naturally expect that the Rous tumour when irradiated in vivo would also prove to be very resistant. Indeed Russ and Scott recorded observations which proved that this was the case. Soon after the publication of their results Dr. J. C. Mottram [2] set out the results of experiments which showed that under suitable conditions the Rous tumour when irradiated in vivo could be made to regress as readily as some of the transplantable tumours of the mouse and the rat. This result was unexpected and indeed paradoxical. The causative agent is present in the tumour, and as the experiments in vitro show, is very resistant to irradiation. Nevertheless the tumour regresses. The fowl in which a tumour has undergone regression shows the same phenomenon of resistance to a second transplantation that is observed in mice and rats under similar conditions. In a recent paper [3] Dr. Mottram has recorded the results of experiments which show how this remarkable result can be accounted for. The outcome of his first series of experiments seemed to deepen the mystery. He irradiated tumours growing in fowls with doses of radium known, from previous experiments, to be sufficient to cause ultimate regression of these tumours. Before regression was complete the tumours were removed and dried in vacuo. When this dried material, which did not contain living cells, was inoculated into fresh fowls new tumours were formed. The same result was obtained with a filtered watery extract of regressing tumours. It is clear, therefore, that a tumour regressing under the influence of irradiation still contains the causative agent or virus in an active form. Why, then, does an irradiated tumour not infect the surrounding tissues and grow by extension, instead of regressing as it actually does?

The answer to this question was found by irradiating areas of the skin and then, after scarifying the skin, applying to it active filtrates of the Rous tumour. Such filtrates, though producing tumours in non-irradiated areas of scarified skin, were unable to do so in the irradiated skin. Histological examination of these skin areas showed that the fibroblasts which are abundantly present in a scarified area of non-irradiated skin are absent in previously irradiated skin. Now McIntosh and Baker have shown very conclusively that the Rous tumour arises from a transformation of the normal fibroblasts, and Dr. Mottram's observations confirm their conclusion. The apparently paradoxical behaviour of the Rous tumour towards irradiation explains itself therefore as a manifestation of the extraordinary specificity of the causative agent or virus, which can only infect the fibroblasts of the fowl, but no other cell. Irradiation of the Rous tumour in vivo damages not only the tumour cells, but also the normal cells of the host which immediately surround the tumour, so that in the neighbourhood of an irradiated tumour there are no fibroblasts which can be infected by the causative agent of the irradiated tumour. These observations are of interest not merely because they offer an adequate solution of a particularly intricate problem connected with the filterable tumours of the fowl; they also have a bearing on the more important general question of the relationship of these tumours to mammalian neoplasms. The demonstration of a specific causative agent separable from the living cell in the former group seems to justify the standpoint that these tumours form a disease sui generis entirely distinct from true neoplasms and, as already stated, until recently this was the attitude generally adopted by cancerologists. The work of Gye, although criticised in its experimental aspects, has nevertheless been instrumental in changing this attitude, and there are to-day few workers in cancer who are prepared to deny outright the true malignant nature of these tumours. The essential similarity between the reaction of the Rous tumour to irradiation and that of true mammalian new growths is evidence in support of the view of the fundamental similarity of these two types of neoplasms, and it is the more convincing as it was unexpected on a priori grounds.

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[1] The Lancet, 1926, ii., 374.
[2] Ibid, p. 1266.
[3] Brit. Jour. Exp. Path., 1928, ix., 147.

DEFECTIVE OBSTETRICS.

New Zealand is justly proud of its low infantile mortality-rate; in 1900 this was 75·2 per 1000 births, last year it was 38·7—a world record. The maternal mortality-rate, on the other hand, was 4·91 per 1000 live births, compared with 3·90, the last five-yearly average for England and Wales—an increase of 0·66 on the figure for the previous year.[1] At the same time the rate for puerperal septicæmia rose from 1·37 in 1926 to 2·51 in 1927. This rate, on the graph prepared by the Government statistician, shows a peak about every ten years, and last year's figure was the highest since 1885. The death-rate from other puerperal causes was comparatively low. Prof. Henry Jellett, late Master of the Rotunda, and now consulting obstetrician to the New Zealand Government, considers that the real maternal mortality-rate is even higher than is recorded. He attributes this great loss of maternal life to two main causes: (1) the insufficient education of medical students in obstetrics, (2) the failure to provide sterilised dressings.

The unduly high proportion of cases in which forceps were used in hospital—namely, 12·5 per cent.—is in itself evidence to Dr. Jellett of faulty obstetrical training. The National School of Medicine is at Dunedin University, and in November last Dr. Jellett, in accordance with the instructions of the Minister, met the medical faculty to discuss the best methods of improving the training. To continue in what are substantially the words of his report: the inadequacy of the present methods, which is fully recognised by the faculty, is in no way due to want of effort on the part of the teachers, but rather to want of adequate clinical material and of the necessary funds. When the new regulations for the training of midwives bear fruit, the midwife will be better equipped in the art and practice of midwifery than the medical practitioner. This is a very serious state of affairs, because the midwife is only trained to conduct normal labour, and if the medical man is insufficiently educated he will be unable to deal with emergencies, and when confronted with them will fall back on radical surgical procedures instead of the milder obstetrical methods which would serve better. If the medical practitioner's education is insufficient, it is probably better that he should not attend confinements at all. The Plunket Society for infant welfare, which cares for the mother n pregnancy and the infant during its first year of fe, has made admirable progress assisted by the upport of the Government and the general public. The obstetrical department of the medical school, however, the work of which is equally important, is left in the same financial position as it occupied many years ago. It has no professor at its head, no suitable hospital in which to educate its students, and insufficient funds to pay its teachers. The public are probably unaware of the close connexion between the poverty of this department and the high maternal mortality-rate. Provision of the needed funds is presumably a matter for the Government, and one which in the present financial position of the Dominion they may find very difficult. There must, however (says Dr. Jellett), be many wealthy individuals or corporations who would be willing and able to help if the need were brought home to them, but this has, so far, not been done. The faculties of medicine and surgery have each £1600 a year, mostly from private benefactions, with which to pay their staffs; the faculty of obstetrics has a bare £530, and even this is to be reduced at the end of this year by £75. Dr. Jellett suggests that the Department of Health make a public demonstration of the needs of the obstetrical department of the medical school a part of its propaganda for the reduction of maternal mortality.

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[1] Report of the Director-General of Health, New Zealand, for the Year ended March 31st, 1928. Department of Health 1928. Pp. 78. 1s. 6d. H 31. Wellington: W. A. G. Skinner.

The second great need, that of asepsis, is treated very fully by Dr. T. L. Paget, inspector of hospitals. He has succeeded after great exertion in making cheap and efficient sterilising equipment available in hospitals, and in minimising the spread of puerperal sepsis in maternity institutions, holding that if the same standard of asepsis were maintained in private practice as under the regulations in hospitals, puerperal sepsis rates for the Dominion would greatly diminish. This depends not only on the education of the medical man, but on the coöperation with him of the patient and nurse. The training of nurses and midwives in asepsis is slowly improving, but much remains to be done, especially in private practice. To quote Dr. Paget: the adoption of asepsis in surgery took 15 years, and the training of the nurses who had not learned it originally was done by surgeons in actual practice. The training of maternity nurses in asepsis can, he says, only be done in a reasonable time, when every medical practitioner feels it his duty to see that it is completely carried out. The patient must be made to recognise its importance, and be advised to choose a nurse who understands it, and to provide a sterilised maternity outfit. The antenatal clinics supply these outfits, yet only 515 of a possible 1900 patients confined in private took the opportunity of obtaining them. Dr. Paget is urging their provision in all centres of maternal welfare; they cost about £1 5s. each if made of towelling (convertible after use into babies' napkins), and 10s. if made from old sheets. He sees the key to the problem of maternal welfare in coöperation between the expectant mother and her husband, a well-trained antenatal clinic nurse, an alert and efficiently trained medical attendant, and a well-trained maternity nurse or midwife on the one hand, and the services of the hospital board, which can provide hospital accommodation for patients who need it, and services for sterilising outfits for all patients on the other. If the Dominion Government and people attack the problem on these lines under the energetic leadership of obstetricians like Drs. Jellett and Paget, there is no doubt of their success, but a great awakening of public interest is obviously necessary. The recent inauguration by Mr. Victor Bonney of the New Zealand Obstetrical Society marked a definite step forward by the profession; the entire frankness of the Director-General's report indicates that the Dominion Government is willing to play its part. The education of the general public lies with the Minister of Health and the lay press.

Annotations.

"Ne quid nimis."

INTERNATIONAL VISIT TO BRITISH SPAS.

MEDICAL hydrology has had its meetings at continental health resorts whether in France, Italy, or Czecho-Slovakia, but until now no international medical party has visited British spas. This is to be put right when the International Society of Medical Hydrology holds its annual meeting from the 9th–17th of next month. The rendezvous will be London, where a reception will take place at the house of the Royal Society of Medicine on Tuesday night, Oct. 9th, and conferences have been arranged for the two following days, under the presidency of Lord Dawson. The first of these discussions, to be introduced by Dr. C. W. Buckley (Buxton), will deal with the organisation of the spas in various countries, especially for the treatment of insured persons, and the second with the humoral factor in disease, with particular reference to the action of waters. After this the party, numbering over 100 individuals of 17 nationalities, will make a tour of the spas, where they will see at first-hand the whole development of the native waters of Britain. At Harrogate opportunity will be given for considering specially the treatment of children by waters and baths, and at Buxton there will be a conference on rheumatism as a national problem. Visits will also be paid to Droitwich and Bath. Places are still available for a limited number of members of the medical profession who would like to make the tour of spas under such stimulating conditions and to take part in the discussions. A programme of arrangements in three languages is available, and particulars may be obtained from the Hon. Secs. of the Society, 139, Marylebone-road, London, N.W. 1.

LOCAL ANÆSTHESIA IN THE REDUCTION OF FRACTURES.

LOCAL anæsthesia is making rapid advances and is being used more and more for surgical conditions which formerly could be treated only under general anæsthesia. English surgeons are perhaps more conservative in their attitude towards local anæsthesia than their American and Continental contemporaries, and, while this is a tribute to the excellence of our anæsthetists, the use of local anæsthesia might with advantage be extended. A useful application has recently been described in two American medical papers—namely, the reduction of fractures of the forearm after infiltration anæsthesia with novocaine or procaine. The shorter article of the two describes two cases of fracture of the forearm which were reduced at the Boston Dispensary after infiltration with 1 per cent. novocaine solution.[1] In the other article[2] Dr. Carl O. Rice, of the Minneapolis General Hospital, gives a more detailed description of this method of reduction, a method he has used with success in a series of more than 50 cases treated during eight months in the receiving ward of his hospital. In no case did the manipulations cause pain, and the greatest discomfort that was ever noticed was a feeling of pressure or a painless grating during reduction. The reduction itself was always easy, and it was never necessary to use much force owing to the perfect muscular relaxation. The only two failures reported were in cases in which the deformity recurred and further infiltration was tried on the next day. The use of a second infiltration is now considered unwise, and general anæsthesia is recommended for the second attempt. Dr. Rice uses a 1 per cent. solution of procaine hydrochloride and the method he employs for the induction of anæsthesia has the merit of great simplicity as no very accurate visualisation of the important structures round the wrist-joint is necessary. After sterilisation of the field of operation with alcohol and iodine two subcutaneous wheals are raised about one inch above the line of fracture in the radius, one opposite to the dorsal border and the other opposite to the lateral border. A needle 2½ in. long is now inserted through the wheal opposite the dorsal border, and the dorsal and lateral surfaces of the radius are infiltrated in turn without withdrawing the needle. The ventral surface is infiltrated from the second wheal, the radial artery and the median nerve being avoided by keeping the needle close to the bone, so that it passes posterior to these structures. If no blood appears in the syringe during the injection the needle must be pushed in the direction of the fracture until blood appears and then about 5 c.cm. of the anæsthetic solution are injected into the effused blood at the site of the fracture. The total amount of anæsthetic used is 15 to 60 c.cm., and manipulations may be started about half an hour after the injection. Obviously this method cannot be used in the presence of infection or in compound fractures, and the risk of infection in uncomplicated cases must be considered. The author, however, considers this to be negligible when reasonable precautions are taken, and no case of accidental infection has occurred in his experience. The fact that the anæsthesia lasts for some time makes it possible to have a radiological examination after reduction; and if necessary further manipulation may be undertaken at once to improve the position of the fragments. It may be stated, therefore, that this method is one to be considered carefully, as it has many applications, even if it is not adopted as a routine in cases in which nitrous oxide anæsthesia would be adequate. The problem of a fracture of the lower forearm, with slight deformity, in the aged, the plethoric, and the alcoholic need no longer exist to worry the busy out-patient surgeon.

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[1] New Engl. Jour. of Med., 1928, cxcix., 66.

[2] Jour. A.M.A., 1928, xc., 1768.

THE CHEMICAL COMPOSITION OF DENTAL ENAMEL.

PROBABLY the technical difficulties attendant on both the chemical and microscopical examination of the enamel of teeth have served to stimulate investigation of a tissue which forms so small a part of the body. But the interest has not been purely academic, for as the external calcified covering of the teeth, enamel represents the first line of defence against caries; when it is destroyed the tooth is left almost, though not entirely, unprotected against destruction. Much of the work on enamel has been histological, but various chemical analyses of this tissue have been made. In this country Sir Charles Tomes's findings in 1896 were that though a trace of organic matter might be present it was not enough to amount to a weighable quantity. Lovatt Evans in 1913 published an analysis and concluded that enamel contained at least from 1 to 2 per cent. of organic matter. Since then no further chemical analyses have been recorded in this country until E. Sprawson and F. W. Bury communicated a paper recently published in the Proceedings[1] of the Royal Society. The specimens of enamel examined were obtained by filing with a metal file. To remove any contamination from the file each specimen was exposed to a powerful electro-magnet such as is used in ophthalmic surgery. The nitrogen content was estimated by Kjeldahl's method, but the ammonia content was determined colorimetrically by means of Nessler's solution. The carbon content was estimated by means of a special apparatus devised by Dr. W. H. Patterson. As a result of a series of 20 analyses Sprawson and Bury find that the maximum organic content of enamel calculated from the highest nitrogen content is 0·15 per cent. The amount of protein calculated from the carbon present is a little higher. Samples of enamel from young persons, from adults, and from the deciduous teeth showed practically no difference in the organic content. Sprawson and Bury appear to have taken careful precautions to avoid fallacies which might vitiate the analyses and to have used very delicate methods. Their results, if they are confirmed, will have a definite bearing on some of the hypotheses of the causes of dental caries and its prevention which are being widely and increasingly championed in many quarters. During the last decade as a result of the microscopical study of enamel there has been an increasing tendency to believe that enamel, far from being practically an inorganic tissue, contains a definite amount of protein and that it is thus a vital tissue, capable of reacting to injury like other tissues so long as the dental pulp remains vital. The evidence for this hypothesis is of a cumulative character and drawn from a variety of observations. Enamel can be stained not only by the treatment of sections, but also by diffusion through the dentine in whole teeth. This would suggest that calcification is incomplete and by inference that the stained areas contain protoplasm. H. Malleson, by means of a delicate technique, was able to decalcify enamel and to demonstrate that the residue showed a definite structure. By analogy with other calcified tissues this would suggest that it contains a distinct organic basis, sufficient to show the character of its structure after decalcification. Although there is a definite line of demarcation between the dentine and enamel, yet the dentinal tubules may extend a short way into the enamel. The late Howard Mummery demonstrated the presence of what he termed fibrous bundles extending from the dentine into the enamel. A. Livingstone attempted to widen this conception and described certain experiments which gave some support to the suggestion that the enamel might act as an osmotic membrane. An observation of much interest was made by Mummery when he described the occurrence of translucency in enamel in cases of early caries of enamel. These closely resembled the translucent zones seen in dentine in the early stages of caries, which zones are known to be caused by the reaction of the pulp producing hypercalcification of the contents of the dentinal tubules. Mummery suggested that the translucent zones in enamel might be caused in the same way—a view which postulates the vitality of enamel. Each or any of these various observations made from different angles might be susceptible of some other interpretation, but their cumulative effect certainly suggests that enamel is not an inert tissue incapable of any change after formation except that of destruction by caries or abrasion. The high degree of immunity to caries in some individuals and the equally high susceptibility in others and also the alternations of susceptibility and immunity often found in the same person at different times might reasonably be explained by changes occurring in enamel after the eruption of the teeth. From this it was an easy step to suppose that it might be possible to influence the resistance of the enamel in various ways, as implied by M. Mellanby in her later work. But whatever inferences might reasonably be based on staining appearances in enamel as to the presence of organic matter, such inferences should be capable of confirmation by chemical analysis and without such confirmation they are deprived of much of their force. In a recent book reviewed on another page Mr. F. W. Broderick refers to Tomes's dictum, that enamel is an inert tissue, as a damper (on the development of the doctrine of the vitality of enamel) which was removed by the work of Lovatt Evans. He makes no mention of the results of Sprawson and Bury. The importance of the discrepancy in results in the view of some dentists is that while the percentage of organic matter found by Lovatt Evans might be sufficient to allow of metabolic changes in the enamel, the percentage found by Sprawson and Bury, confirming Tomes, is considered to be almost negligible. But the discrepancy is not really so very great, and probably none of the experiments here described shows whether the enamel is alive or not. That depends on its reactions to conditions rather than on its chemical composition. And in any case it is probably only a small part of it which *can* be alive. Pending further work no decision can be taken as to whether enamel once formed is incapable of change or whether it remains within the pale of nutrition.

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[1] On the Chemical Evidences of the Organic Content of Human Enamel. Proc. Roy. Soc., B., vol., cii. 1928.

SWIMMING BATH WATER.

THE Wheatley Memorial, as we pointed out last week, lays very just stress on the desirability of running water for public bathing. Even the watercress refuses to use a stagnant pool. Nevertheless it must not be forgotten that it is possible to disinfect the water of public swimming baths so as to make it safe for bathing or even safe (if not appetising) for drinking. Dr. G. K. Bowes in the current *Journal* of the Royal Institute of Public Health regards it desirable to adopt as stringent a standard for bathing water as for drinking water. To do so, however, requires a disinfecting agent continuously present in the water, the simplest and cheapest being free chlorine in the proportion of 0·2 to 0·5 parts per million. Dr. Bowes bases his recommendations on the examination of the water of public baths in Birmingham during two consecutive summers. In America, it appears, use is made of a standard frankly called "the index of stagnation," which consists of the number of bathers divided by the amount of clean water added, measured in thousands of gallons. It will readily be admitted that under a controlled water régime of this kind the incidence of conjunctivitis is likely to be small and any possible risk of the spread of poliomyelitis in this way disappears altogether. The occurrence of suppurative otitis after bathing is on rather a different footing, for this is presumably due simply to the careless admission of water to an infected middle ear whose safety lies in remaining dry. The use of natural running water remains the obvious course for bathers who dislike the accumulation of bacterial and human detritus, and we have little doubt that the memorial to be raised to Dr. James Wheatley will produce a good response.

THE LIMITATIONS OF PLASMOQUINE.

THE Hamburg School of Tropical Medicine, and foremost amongst them Dr. Otto Fischer,[1] have been energetically investigating the action of plasmoquine in human malaria; nor have they neglected the less favourable side of their subject, careful records being kept of the toxic symptoms occasionally caused by the drug's administration. Of these, methæmoglobinæmia is the most alarming, resulting as it does, in cyanosis. Experiments on otherwise normal cats have shown that daily doses of 0·1 to 0·15 g. plasmoquine invariably produce methæmoglobinæmia, but that the intimate mixture of quinine sulphate with plasmoquine seems largely to mitigate this and other toxic phenomena. Thus it has been shown in clinical practice that, if quinine be combined with plasmoquine in a dose of 1·0 g. daily, either no methæmoglobinæmia results or the amount is negligible. Subcutaneous injection of plasmoquine has been attempted at Hamburg, and in doses of 0·02 g. daily was not attended by any ill-effects; but this quantity is too small to have any permanent effects in eradicating the infection, although it may control multiplication of the parasites. On an average the minimal therapeutic dose of plasmoquine is 0·06 g. daily, or 0·01 g. to every 10 kg. of body-weight in benign tertian malaria. In subtertian malaria a total amount of 0·15 g. injected, or a total amount 0·2 g. by the mouth, suffices, whether spread over several days or given more massively within 24–36 hours, to eradicate crescents from the peripheral blood within a period of five days. Failure to banish crescents only occurs when the schizonts are not sufficiently exterminated and can undergo transformation into gametocytes. According to Fischer's observations, plasmoquine-resistant forms of malaria are extremely rare. This is specially true of the benign tertian parasite, in which Fischer has not seen a single failure, but in subtertian malaria three instances have been noted, in which crescents persisted in the blood stream while the patient was taking full doses of plasmoquine. Then it has already been claimed that plasmoquine exerts a selective effect upon the crescents, and his statement appears somewhat paradoxical, but the anomalous effect can be explained by failure of the drug to cause rapid death of the younger schizonts in the earlier stage of the infection. When plasmoquine is combined with quinine there is no such failure, which is a further argument in favour of combining these two drugs and of administering the plasmoquine component in a subminimal therapeutic dose.

SELF-KNOWLEDGE AND MENTAL HEALTH.

IN a paper read before the British Association Dr. William Brown stressed a point of great importance in the application of the method which he prefers to call "deep analysis" to the cure of psychoneuroses or symptoms referable to faulty adjustment of the mind. That is, the necessity, if a real and lasting cure is to follow, of ensuring not only that the patient shall acquire adequate knowledge of himself, his real needs and his errors, but also that he shall apply that knowledge to setting himself in order, correcting his faulty tendencies and habits, and developing an enlightened self-command. It seems that the more devoted followers of Freud are inclined to neglect this constructive aspect of analysis. Dr. Brown criticises the use of the term "psycho-analysis" for both of two distinct concepts that should have distinct names—first the Freudian method of deep analysis by free association; and, secondly, the Freudian theory of mental function and the manner in which it is modified by this method. This ambiguity is probably not so much a cause of the Freudian tendency to underrate the value of constructive re-education as the expression of an attitude of mind, not confined to the Freudians, that considers the method more than the result. It is a pity that this attitude should exist, but that it does is shown by the divergencies which are so evident between the various schools of psychological thought and impose such a handicap on progress. Dr. Brown therefore uses the term "deep analysis" for the method, reserving "psycho-analysis" for the body of doctrine.

The Freudian system lays what many, including Dr. Brown, consider a disproportionate stress on self-knowledge. Deep analysis is a process by which, in the course of many months and sometimes years of passive re-living of infantile experience and of the "transference" to the analyst of the emotional reactions which have been insufficiently related to the parents and to other persons who have partially replaced them, the patient acquires a knowledge of the primitive layers of his mind. In discussing his experiences with his analyst, who for the time being stands to him for an immensely superior personality, on whom he is extremely dependent and by whom he is highly suggestible, he inevitably adopts, often wholesale, the theory by which the analyst directs his method. Obviously the more rigid this theory is the less will the patient's own personality be able to evolve its own theories and shape the course of its own re-education. And if one thing is held by the leaders of analytical thought to be more important than any other it is that the patient must be led to think for himself, to work out his own salvation. It is for the analyst to provide the material and to indicate the ways from which the patient shall choose, but ultimately the patient himself must decide which way he shall go and what use he shall make of the material. It is of no use reducing the patient to a state of entire dependence and then turning him loose. After the analysis has been completed and the deepest emotional complexes and their ramifications are laid bare, there comes what many workers consider even a harder task—the education of the patient up to the point where he can free himself of this dependence and become an autonomous being. This is where many analysts, and among them many Freudians, fall short; they do not finish their job, and the patient has either to go elsewhere or remain almost as imperfectly adapted as he was in the beginning.

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[1] Münch. med. Woch., August 10th, p. 1369; and August 17th, p. 1417.

It is obvious, therefore, that the constructive analyst will exercise great discrimination in the material he provides. It is no good spending weeks in working out infantile phantasies if the resulting knowledge is not going to be usefully employed in the reconstruction by which the patient hopes to adapt himself to the world. The analyst who adheres too closely to a preconceived method will almost inevitably allow his patient to pursue his way through many weary and overgrown by-paths which lead nowhere but into an impenetrable jungle and from which the return may be difficult and painful. The good analyst, like the good artist, knows what to eliminate and where to stop. Dr. Brown speaks of the great resistance which patients sometimes manifest to the process of analysis—" I wish I had not come. I ought not to have come to-day." Some degree of resistance is inseparable from an experience which must at certain crises be extremely unpleasant, but there are almost certainly resistances which arise from the real conviction of the patient's own creative personality that the way ahead of him is one that he would do better to avoid. An experienced man will often oppose his patient's resistances, but he will always respect them; some kinds of broken resistance may mar an analysis as badly as an unnecessarily cut nerve or tendon may mar a surgical operation. It is undoubtedly possible to have too much, even of such a good thing as self-knowledge. Mental analysis has long established itself as an indispensable weapon against the storms and stresses with which life assaults the mind, and the need to-day is, as Dr. Brown says, for analysts with independent and vigorous minds and a determination to think hard for themselves and evolve their own methods and theories. As is the master, so is the pupil, and the more completely an analyst has worked out his own transference on the master of his school and become self-directing, the more completely will he enable his patients to work out their transferences on himself.

X RAYS AND WHITE BLOOD CELLS.

That in the treatment of blood conditions repeated divided doses of X rays are more effective than a single massive dose is a principle generally accepted by radiologists, though up to the present it has lacked experimental proof. Such proof is in some measure supplied by the recent work of W. V. Mayneord and A. Piney[1] carried out at the Cancer Hospital. Using a carefully standardised technique, these observers in the course of an investigation into the effect of X rays upon the blood and blood-forming organs, found that a much greater result was produced in rabbits by a dose of approximately 500 R spread over 24 days than by the administration of the same dose at one sitting. As criteria of the effect of radiation upon the blood, these observers used the changes brought about in the three orders of white cells—lymphocytes, neutrophiles, and monocytes. They confirmed the old observation of Heinke[2] that the first and most striking effect of radiation is a progressive diminution in the number of lymphocytes, to be followed by an increase in the neutrophiles and, if the dosage is pushed to extremes, by a rise in the monocytes. At the Cancer Hospital it was found that a persistent increase in the monocytes usually served as an indication of irreparable damage and was followed by the death of the animal. Whether or not the monocyte of the rabbit is to be regarded as the strict homologue of the same cell in the human being remains to be decided; in any case this observation obviously calls for similar investigations in the case of human beings receiving X ray treatment. Typical lymphopenia was found as an early manifestation in the blood of the women affected by the radio-active substances in luminous paint, to whom Sir Thomas Oliver refers (see p. 634); it would be of interest to know if in the cases which proved fatal the monocytes were found to be greater in number than the lymphocytes. Mr. Mayneord and Dr. Piney found in the case of rabbits that death inevitably ensued if the monocytes in the blood came to exceed the lymphocytes in numbers. Working on the spleens of radiated animals Dr. Piney was able to demonstrate a selective action on the part of the rays for the lymphoid tissue of the Malpighian corpuscles, and he suggests that a generalised selective action upon lymphadenoid tissue is the explanation of the lymphopenia induced by radiation. That lymphadenoid tissue is peculiarly susceptible to X rays is shown by a number of clinical observations, notably the susceptibility of the glands in Hodgkin's disease and of the tumour masses in lymphosarcoma to the action of these rays.

"THERAPEUTIC-MINDEDNESS: A PEDAGOGIC PROBLEM."

Under this heading Dr. Paul Reznikoff, of New York, attacks[1] the doctrine that in medical practice treatment is less important than diagnosis. Whilst strenuously opposed to a return to "the enormous number of drugs and methods that preceded the age of therapeutic nihilism," he maintains that present methods of instruction fail to develop a correct mental habit, which he calls therapeutic-mindedness, a desire to heal. On analysing the treatment given in different diseases at a certain hospital, he found much support for his view that therapeutic-mindedness is at a low ebb. In lobar pneumonia, for instance, good or questionable treatment was started in the first eight hours of treatment in only 64 per cent. of cases. Generally speaking, the less dramatic the disease the lower was the percentage of effective treatment. Whereas all the patients in coma at once received good treatment, the percentage of cases in which it was given immediately was only 50 for meningitis, 70 in broncho-pneumonia, and 28 in colitis, and the unfortunate sufferers from sciatica were none of them efficiently treated during their first eight hours. Dr. Reznikoff is well aware that it is largely fatigue that causes the intern who has completed history-taking and physical examination to omit much thought of treatment, and he thinks that the remedy for this faulty attitude is not so much to provide separate courses for the teaching of therapy as to combine the teaching of diagnosis and treatment in such a way that in the mind of a physician failure to alleviate a headache or insomnia shall rankle as much as failure to diagnose an aneurysm. In order, therefore, that the clinical clerk shall give proper attention to his therapeutics, he should attend not only a course in pharmacology and theoretical therapeutics, but also medication conferences and "diet conferences," and—perhaps most important of all—demonstrations of such procedures as colon irrigation, steam inhalation, throat irrigation, hot packs, and bed-making. After each procedure or demonstration the uses of the measure should be discussed, and Dr. Reznikoff finds that the students become so interested in these conferences that many express their desire to spend some time as orderlies in the wards in order to master the methods.

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[1] British Journal of Radiology, August, 1928.
[2] Mitteil. a. d. Grenzgeb. d. Med. u. Chir., 1905, xiv., 21.

[1] Jour. Amer. Med. Assoc., August 18th, p. 450.

With such a course of instruction and with the objects that underly it none can fail to sympathise. Many practitioners must wish that they were more in touch with the actual drugs they prescribe and with the methods they order nurses to carry out; it is more than likely, for example, that a large proportion of medical men have neither administered nor observed the administration of the simple soap enema. To correct such defects in experience is obviously desirable, and the attempt is made with more or less success at many of our hospitals. The reader, therefore, may be left wondering whether there is any reason for a cleavage between those who advocate treatment and diagnosis respectively; both wish the patient well, and both are supposed to be making intelligent use of the known facts. But undoubtedly there is some such cleavage. The conservative physician is especially impressed by the fact that all forms of treatment are but mild adjuvants to Nature, and consequently places most highly the need for an estimation of the diagnosis and course of the disease; the enthusiastic "progressive" physician is anxious at all costs to see some improvement or alleviation by whatever methods are available. Both schools are liable to fall into serious error, and whilst agreeing with Dr. Reznikoff in condemning diagnosis without treatment we must admit that treatment without diagnosis is apt to be the more dangerous. And even in Dr. Reznikoff's excellent paper it is possible to detect pitfalls into which the enthusiastic therapeutist may plunge unawares. In the opening paragraph we read that "everyone connected even remotely with the profession agrees that, whatever else the physician may be, he is above all a healer"—a sweeping statement with which many will flatly disagree. And when he goes on to say that "in the matter of therapeutics the future physician must . . . develop an emotional habit" besides a mental habit, he is inserting a line of divorcement between the departments of diagnosis and therapeutics which he has been elsewhere so anxious to weld into a consistent whole.

THE SELF-SUPPORTING HOSPITAL.

WILL the voluntary hospital continue to be voluntary, in the sense most of us at present attach to the word—that is to say, will it remain an institution, supported mainly by voluntary contributions, which gives free treatment to patients—or will it be replaced by the self-supporting hospital? This is the question which Dr. R. J. A. Berry, Professor of Anatomy and Dean of the Medical Faculty in the University of Melbourne, recently put to an audience in that city. Prof. Berry is well-equipped for discussing the subject, since last year he travelled 30,000 miles on a mission of inquiry into hospital and medical problems. The result of his investigations, as detailed in his address, was a strong conviction that the future is to "the medical centre devoted to community health" and its associated self-supporting hospital. He was "profoundly impressed" with this centre, as seen at work in the United States and Canada, and almost as profoundly dissatisfied with the voluntary hospital system of Great Britain which in the main he found, like the hospitals of Melbourne, to be "totally divorced from the pre-clinical and scientific laboratories of a medical school." Prof. Berry laid stress upon the right of the patient, whatever his means, to the benefits of institutional coöperation, coördinated medical knowledge, and individual service, benefits which, so far at all events as Melbourne is concerned, cannot be obtained to the full "in the present isolated hospitals, laboratories, and incomplete medical school" of the city. No one will quarrel with this claim, nor is there any expert at home who fails to recognise that the voluntary hospital is in a state of transition. That our hospitals are all so destitute of immediate association with medical education and laboratory research as he suggests cannot however, so readily be conceded. The connexion between university, medical school, and hospital is by no means unfamiliar, and the advantages of that connexion are so patent that the movement towards the medical centre, where it does not exist, has already begun. Such centres can be planted only in great towns, yet it should always be possible to affiliate to them those smaller local hospitals which often stand seriously in need of the practical experience and scientific help of the great institutions which exist as much for research and prevention as for curative purposes. The isolated individualism of our voluntary hospitals is a drawback which cannot but have an inimical influence upon their usefulness, and it seems inevitable that, sooner or later, we shall have something in the nature of hospital circles radiating from great scientific centres. The self-supporting hospital, which Prof. Berry found so frequently on the North American Continent, is really the voluntary hospital with a difference. It acquires self-respect by being relieved from the necessity of making constant appeals for money, and instils self-respect into those of its patients who are not actually indigent, by teaching them the unworthiness of expecting "something for nothing," an expectation which Prof. Berry has found widespread and resents. He enumerates the sources of revenue of the trans-Atlantic self-supporting hospitals as receipts from endowments which are sometimes considerable, since "no wealthy man dare die in the States without leaving something to his university, home-town, or favourite hospital"; payments for hospital services from middle-class and wealthy patients; payments from local authorities for patients unable to pay for themselves. Thus the occupant of every bed pays, or is paid for. The system is, in effect, a fusion between the voluntary hospital, as we know it (with or without "pay-beds"), and the poor-law infirmary, maintained out of public funds, with this important difference, that nobody is called by the absurd name of pauper. The bill, whether presented to the patient or the authority responsible for him, includes the medical fees which are paid over by the hospital to the medical consultant in charge of the case. If hospitals are to be open, as they already in considerable measure are open, to patients of all classes, that part of the voluntary system which implies the free services of the medical profession goes by the board. The institution of "pay beds" which is becoming so common is a recognition of the changed situation that has been forced upon hospital managers, but it may be found, in the end, to be no more than a palliative.

TRANSMISSION OF DISEASE BY AEROPLANES.

AN Australian correspondent draws our attention to some of the implications of the flight made by Kingsford Smith and his associates from San Francisco to Brisbane. New standards of rapidity in communication must have the effect, he points out, of bringing "the endemic centres of hitherto exotic disease" into dangerous proximity to Australia. Separated by long sea voyages from the primitive sanitation of the East, the Commonwealth has, up to the present, kept fairly free from Oriental infections: thus there has been no case of small-pox since August, 1921, and plague has not occurred since June, 1923. Cholera and yellow fever, indeed, have never penetrated Australia's quarantine barrier, an important factor in this happy state of affairs being the length of time that must elapse on the journey from an infected port. Plague and cholera are prevalent at Rangoon and Bombay, but during the voyage t Australia from these cities any infection is sure t manifest itself on board the vessel, as the incubatio period is less than a week. By fast air transport, however, Rangoon is only 62 hours' journey from Australia. Small-pox, moreover, may not develop until 16 days after exposure to infection, within which time, as Hinkler showed, it is possible to travel the whole way from England. The solution of the problem, our correspondent considers, cannot be quarantine; for who would travel 6000 miles in 84 hours in order to spend the following two or three weeks in a quarantine station? The only possible control, he believes, is by a scheme of quarantine surveillance, whilst vaccination and similar means of mass-immunisation will again have to be utilised to protect a community freshly exposed to risks which it has almost forgotten.

DEATHS UNDER ANÆSTHETICS FOR DENTAL OPERATIONS.

The percentage of deaths occurring under anæsthesia for dental operations is extremely low, far lower indeed than for general operations; yet fatalities do occur and the number in any year is by no means negligible. The fact that the operation of dental extraction for which the anæsthetic is usually given is of a relatively trivial character, makes the occurrence of death from the anæsthetic employed peculiarly tragic. Our contemporary, the *Dental Surgeon*, has devised a questionaire which it is intended to circulate to those doctors and dentists unfortunate enough to have a fatal case, with a view to eliciting a body of information which may in time become large enough to provide valuable information. As the *Dental Surgeon* truly points out, the reports of such cases are usually of a meagre character and provide little material for forming a judgment as to the best general anæsthetic for dental operations and the conditions favourable or unfavourable to the patient's safety. The idea of such an inquiry is a good one, and we hope that the questionaire will be fully and carefully filled up. It has been so framed as to cover all the essential points, and there can be no doubt that if it should prove possible to collect enough data, knowledge would be gained which might be the means of reducing still further the number of deaths during dental operations.

EFFECTS OF A HIGH CARBOHYDRATE DIET ON LACTATION.

The claim has frequently been made that starchy foods have a stimulating effect upon lactation, but no systematic study of the influence on breast-milk of supplementary nourishment by one particular starchy food being available, it was decided by three American workers to carry out a thorough investigation of this nature, and their findings were reported in a recent issue of the *American Journal of Obstetrics and Gynecology*.[1] The substances chosen were rice and tapioca, because of their similarity, because both are inexpensive, familiar in the ordinary home, and capable of being prepared in a great variety of ways, and because it has been asserted that tapioca is a galactagogue. A series of 130 lactating mothers in a hospital were divided into three groups, each patient being placed in rotation on her admission and all grossly abnormal cases being eliminated. Group I. received the regular hospital ward diet, and Groups II. and III. this same diet, except that the noon-day dessert was omitted and 60 g. of rice and tapioca respectively were added. A little later a fourth group was started, to whom fat in the form of cream of the same caloric value as the starchy foods was added to the ordinary diet. The hospital dietary had a caloric content of about 2600, the others being brought up to a total of about 3000 calories. The diet was begun 24 hours after delivery, under careful supervision. On the fifth and ninth days, as nearly as possible at the same time, one breast of each patient was completely emptied by electric breast-pump, and the milk analysed, and the babies were weighed for test feeds at the same hour each day.

The most important feature of the results seems to be that the quantity of milk obtained by the baby was definitely higher in the two carbohydrate groups, the average intake being 2·40 oz. in the rice group, 2·47 in the tapioca group, 2·01 in the cream group, and 1·84 oz. among those whose mothers were receiving the hospital diet. The differences are comparatively small, but the most rapid growth after the fifth day was found in the rice and cream groups, and all three classes with additional feeding regained their birth-weights during the time in hospital in greater proportion than the control series. The conclusions drawn from the investigation are these: In all four groups the appearance of milk in the mother's breasts occurred about the third day, and in all there was a tendency for the protein to decrease and the sugar and fat to increase from the fifth to the ninth day; on the fifth day the sugar content was lowest in Group I. and highest in Groups III. and IV. (tapioca and cream), and by the ninth day the rice group also had milk containing a high percentage of sugar; the largest quantities of milk, as tested both by the breast-pump and by the weighing of infants before and after feeding, were secreted by the rice and tapioca-fed mothers; the cream diet was the only one resulting in an increased fat content of the milk on the fifth day, but by the ninth day all groups showed about the same percentage of fat. The practical result would seem to be that, by yielding a slightly larger volume and a higher lactose content, the increased carbohydrate diet supplies the baby with a greater fuel value than the ordinary diet.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

IV.—THE INTERPRETATION OF REPORTS ON SPUTUM.

By S. Roodhouse Gloyne, M.D. Leeds, D.P.H. Lond.,
PATHOLOGIST TO THE CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS.

(1) Collection of Material: Physical and Chemical Characteristics.

Obtaining a Specimen.

A patient who has sputum cannot be considered to have a normal respiratory tract, and it may be just as important to examine the sputum as it is to apply a stethoscope to his chest. For practical purposes sputum may be regarded as secretion which comes from the respiratory tract, the ciliated epithelium being assisted in their action by coughing or "clearing the throat." It is not uncommon, however, for saliva and stomach contents to be sent to the laboratory as sputum.

Sputum expectorated in the early morning before food is best for bacteriological examination, and the patient should be asked to rinse out the mouth with sterile water before expectorating the sample. Blood-clot, although complying with the definition of sputum given above, does not as a rule give helpful information on bacteriological examination, except in the relatively rare cases of broncho-pulmonary spirochætosis in which disease hæmoptysis may be a prominent symptom. In cases of early pulmonary tuberculosis with hæmoptysis it often happens that the patient has no sputum except for a few hours, or perhaps a day, following the cessation of the hæmoptysis, when he may expectorate a few drachms. This small quantity of sputum generally contains tubercle bacilli, and the opportunity of sending it to the laboratory should never be missed. Such an opportunity may not occur again. Only a small quantity—a few drachms—of sputum is necessary for bacteriological examination. A small fresh specimen sent to the laboratory as soon as possible after expectoration is better than a large accumulation of stale sputum collected for a whole day. Autolysis takes place in sputum allowed to stand, during the process of which cells soon degenerate and some pathogenic organisms die out. Tubercle bacilli, however, survive many days after autolysis is complete If a laboratory outfit be not available the ordinary flat-sided bottle commonly sed for tablets and throat lozenges makes a suitable ubstitute. The bottle should, of course, be sterilised efore use and in sending by post should be carefully cked and marked "pathological specimen." These rections may seem superfluous, but it is surprising w often they are neglected by the patient.

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[1] The Influence of Supplementary Feeding of Carbohydrate upon Lactation. By Israel S. Kleiner, Ph.D., John E. Tritsch, M.D., and Lulu G. Graves, B.E., New York City.

Children generally do not expectorate readily, and it may be necessary to instruct them how to clear the throat and bring up sputum. This is best done by an adult demonstrating the process for them. Sometimes a small particle of sputum may be picked off the pharyngeal wall by means of a throat swab. When children with pulmonary tuberculosis swallow heir sputum the bacilli can frequently be found in the eces. Probably all patients swallow a certain amount f sputum during sleep. Post-nasal secretion can be btained also by clearing the throat; failing that naceous secretion can be removed from the post-nasal space by means of a swab and the whole sent to the laboratory. When an examination of pus from an accessory sinus is required the "wash out" may be sent for examination, saline being used for the occasion instead of the usual antiseptic.

A full report on a sputum examination would give a description of :—

(1) Physical characters, whether foul smelling, mucoid, mucopurulent, purulent, or blood-stained.

(2) Chemical—the presence of albumin, bile, &c.

(3) The character of the cells, those found in different kinds of sputum being large squamous epithelial cells from the oro- and laryngo-pharynx, epiglottis, and vocal cords, ciliated columnar cells from bronchial epithelium, alveolar cells from lung substance proper, neutrophil leucocytes, eosinophils and lymphocytes. Malignant cells, pigment and fat containing cells are less commonly recorded.

(4) The bacterial flora.

(5) Any unusual substances, such as fibrin, amœbæ, spirochætes, Charcot-Leyden crystals, or Curschmann's spirals.

(6) Virulence tests in suitable animals—the guinea-pig for the tubercle bacillus, the mouse for the pneumococcus and some strains of streptococcus.

A complete examination of this kind is, however, rarely needed, and as a rule the pathologist presents a report only on (1), (3), and (4).

Physical Character.

Mucoid sputum, often greyish in colour from admixture with atmospheric dust, is generally found in post-nasal catarrh, chronic pharyngitis, and bronchitis. The chief characteristics of this kind of sputum are the presence of large squamous and ciliated epithelial cells together with the so-called catarrhal organisms, amongst which the Gram-negative *M. catarrhalis* is usually conspicuous. Pneumococci are generally of the unclassified group IV. type and streptococci of the "salivarius" class. Growth is usually luxuriant and virulence for animals low. Mouth organisms are common.

Mucopurulent sputum of the typical "nummular" type is the common concomitant of pulmonary tuberculosis. The cells are mostly of the pulmonary alveolar type, but the significance of these is rarely emphasised in face of the much more important tubercle bacillus.

Purulent sputum suggests septic bronchitis, broncho-pneumonia, pulmonary abscess, and gangrene, and bronchiectasis. In the last three conditions mentioned it is usually very foul smelling. The bacterial flora is generally very mixed; virulent types of pneumococci and streptococci predominate, but in the fœtid sputum of bronchiectasis and abscess all kinds of unidentified Gram-positive and negative organisms, often anaerobic, crowd the specimen, and mouth spirochætes are common. A report of large numbers of organisms of different kinds in a foul-smelling sputum is very significant of bronchiectasis.

The typical *sputum* of lobar pneumonia is "rusty" looking and sticky, and generally yields the pneumococcus in nearly pure culture. It must be borne in mind, however, that there are many aberrant forms of pneumonia, especially during an influenza epidemic, and these are often characterised by a mixed bacterial flora. In this case, however, the sputum is not typically "rusty" looking.

Blood-stained sputum may be traced to a variety of causes. In pulmonary tuberculosis the finding of the tubercle bacillus, and in broncho-pulmonary spirochætosis the presence of large numbers of spirochætes decide the diagnosis, but there are many cases where the examination of sputum will only yield indirect evidence in support of a diagnosis. In the first place, it is important to ascertain that the blood comes from the respiratory tract. Blood-stained sputum is generally frothy and has an alkaline reaction, blood from the stomach is usually not frothy and is darkened in colour from action of gastric juice, and if mixed with gastric contents the material is likely to be acid. Post-nasal bleeding may be associated with mucus or with muco-pus, or it may consist of pure blood, in which case there will be but very few cells except red blood cells. Post-nasal blood may be swallowed and then vomited. A microscopical examination of the cells in blood-stained sputum may help in showing bronchial epithelium, alveolar cells, pus, squamous pharyngeal cells, and the like. The presence of starch granules or particles of food may also assist in deciding on the source of specimen. In suppurative lung diseases such as bronchiectasis, abscess, and gangrene, blood-stained sputum and hæmoptysis are not uncommon. The great predominance of pus cells, the enormous number of bacteria, of mixed and often unidentified species, and the foul smell, are usually sufficient to clinch the laboratory diagnosis. In mitral disease with failing compensation the capillary oozing into the mucoid secretion often gives a characteristic pink tinge to the sputum. Later, streaks of blood may be present in the mucoid sputum. Infarct produces a much larger amount of blood and of a darker colour, but this is not sufficiently characteristic for diagnosis. Blood-stained sputum may follow operation or the administration of a general anæsthetic, and may be due to trauma, embolus, secondary infection, or the lighting up of quiescent pulmonary tuberculosis. A bacteriological examination for the tubercle bacillus and other organisms is important. Malignant disease of the lung is often described as producing prune juice sputum, but it is neither a helpful nor characteristic description. It should not be forgotten that the malingerer—especially if he has had experience in a sanatorium—can produce a very good imitation of blood-stained sputum from a small abrasion of the gum. Generally it is a more or less homogeneously coloured pink frothy saliva which contains practically no cells but red blood corpuscles. The malingerer will sometimes borrow sputum from another patient, especially if compensation or a pension claim be pending. When suspicion is aroused, the specimen sent for examination should be coughed up in the presence of doctor or nurse.

Chemical Tests.

The presence of *albumin* used to be considered indicative of pulmonary tuberculosis, but it is found in other inflammatory conditions and is not really very helpful as a diagnostic sign. *Bile* is found occasionally when liver substance communicates with lung by ulceration through the diaphragm, but it is more commonly due to the accidental admixture of stomach contents and sputum.

Special Articles.

SPORADIC DYSENTERY IN A LARGE CITY.

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DYSENTERY is no novelty in Newcastle. It was a frequent visitor in the eighteenth century, when its signs and symptoms were known and adequately recorded. In comparison with the carefully worded and meticulously studied description given by one of the city's physicians, Dr. Andrew Wilson, in his "Essay on the Autumnal Dysentery" in 1760, the accounts of the disease to be found in modern text-books are but colourless epitomes.[1]

One has only to read the graphic descriptions of those days to realise that the old-time clinician had a very definite conception of the cardinal features of the "bloody-flux," and of its existence as a separate entity, altogether different from cholera on the one hand and the simple diarrhœas on the other. From the fact that mention of hepatic signs and sequelæ is lacking, it is obvious that the condition then prevalent was a bacillary and not an amœbic dysentery. Later records are to be found in the Annual Reports of the Newcastle Dispensary,[2] and every year from its opening in 1771 until 1900 a number of cases passed through the books of that institution. In some years the disease was apparently epidemic—for example, in 1783 and 1785 when 329 cases with 17 deaths find record, but more generally the numbers are small. In some of the city's death returns during the nineteenth century dysentery can be separated from its companions—diarrhœa, zymotic enteritis, and intestinal catarrh—and during the ten years, 1874–83, 60 deaths were attributed to it. From 1901 until the war years the record, both of the dispensary books and the death returns is blank.

Under the regulations of 1919 dysentery became a notifiable condition and in that year ten cases, with one death, were so notified. The numbers gradually diminished until in 1924 there were none. In 1925 a group of cases, due to the para-Shiga organism mentioned later in this article, came to notice. These were followed in July of 1926 by a definite outbreak of six cases of so-called "food poisoning," from five of which a Flexner bacillus was isolated.[3]

History of the Present Series of Outbreaks.

In the first week of March of the present year three cases of a mild dysentery due to *Bacillus dysenteriæ* Flexner occurred in two related families, which, though normally residing apart, had been temporarily sharing the same home in Cowgate, one of Newcastle's newer suburbs. Recovery was uneventful in all these cases. During the last week of the same month and the first fortnight of April four sudden deaths in children, aged from 7 to 9, were reported, and each of these was subjected to post-mortem and bacteriological examination. In two of these cases the bacteriological findings were negative, and the deaths were recorded from the pathological evidence as being due to gastro-enteritis; in the other two cases it was ascertained that a bacillary dysentery had been the cause.

In view of this sequence of dysenteric infections, a circular was issued on April 18th by the medical officer of health for the city, requesting practitioners to notify any severe cases of acute enteritis which they might encounter in their practices. All cases notified were carefully investigated, and any with signs or symptoms suggestive of dysentery were removed to the City Hospital for Infectious Diseases. Stools, &c., were bacteriologically examined, not as a routine, but wherever the history of the case seemed to indicate its advisability. Up to June 30th, 64 notifications from all sources had yielded 17 cases of bacillary dysentery with two deaths. Of the 47 non-dysenteric cases notified, four died, but only one was brought to post-mortem examination. In this, as in the other three, death was returned under the omnibus term of gastro-enteritis. For the period March 1st to June 30th there are thus records of 22 cases of dysentery, all bacteriologically proven, four of which have terminated fatally. These 22 cases have been found in 15 separate households. The sex and age-distribution of the cases were as follows:—

Thirteen, or 59 per cent., were in females, with one death, representing a female case mortality-rate of 7·7 per cent. The remaining nine cases were males. Three died—a male case mortality-rate of 33·3 per cent. There were no cases under the age of 12 months, two were under 2 years, three in the age-period 2–5, ten from 6–10, one from 11–15, and six above the age of 20. Three deaths occurred in the age-period 6–10, and one from 11–15.

Clinical Features.

Two very different types of the infection were encountered, the one mild from the beginning—a simple dysentery—the other fulminant and fatal, suggesting the form of the disease known as entero-dysentery.

Mild Cases.—The average length of stay in hospital of ten non-fatal cases was 18 days, and this period was sufficient to cure symptoms, establish convalescence, and prove the disappearance of the infecting organisms from the stools. The ordinary clinical history is as follows: The onset is gradual with headache, occasionally associated with vomiting. Within a few hours diarrhœa commences, and generally the first motions are loose and fæcal. The bowel is soon emptied of fæcal contents, and thereafter the motions are almost pure mucus with varying quantities of blood. "Jelly and blood" is a graphic description of the motion frequently obtained by the history-taker, though the true red-currant jelly stool of dysentery has been seen only on one or two occasions. The diarrhœa is very frequent—every 20 or 30 minutes—40 to 60 stools in the 24 hours, and this stage may last for four or five days, unless treatment has been adopted. Even after treatment has been commenced the cessation of diarrhœa is gradual, and there is generally some looseness of the bowels with brown and grumous motions up to about the tenth day. Throughout the diarrhœic stage colicky pains are invariably present in greater or less degree, and are relieved by the passage of stools. Tenesmus has been complained of in the majority of cases. Abnormal abdominal distension was not observed in any case. Some indefinite tenderness over the pelvis is frequently elicited, but pain on pressure over the descending colon was never obtained. Enlargement of the spleen was only found in one patient. Slight furring of the tongue is generally present.

The bronchitic signs described in Sonne infection by the Aberdeen observers were absent in the few cases concerned.[4] The temperature is elevated—generally from 99°–100° F. in the evening, and about ½° less in the morning. There is a progressive defervescence, and about the tenth day, coincident with the improvement in the intestinal condition, the temperature is usually normal, and convalescence is assumed to have begun. About two days after this the bacteriological examination of another stool is commenced, and by the time the report on this is available (i.e., five to seven days) the patient is generally fit for discharge.

The latest date on which dysentery bacilli have been found in the stools was the tenth day of the disease, but this only happened in one case, and as a rule they have rarely been obtained later than the sixth day—the first three days being the most favourable for their isolation. On two occasions when multiple clinical cases have occurred in a household, the stool has only been positive in one case, but the blood serum of another taken at a later date has agglutinated the organism from the stool of the positive case in high dilution. There have been no relapses in hospital, nor, as far as could be ascertained by routine inquiry, after discharge. Treatment has been largely symptomatic, and sodium sulphate in doses of from grs. 40–60 three times a day has been adopted as a routine in the first four or five days.

Fulminant Cases.—In this type of the disease, the onset, development of symptoms, and death have followed one another so swiftly that the average duration of such a case has been less than 24 hours. The onset is extremely sudden, and as in the mild type headache has been common; vomiting, moreover, has been an invariable symptom. Colicky pains and diarrhœa with mucus and blood have followed. The number of such stools has usually been relatively few—perhaps about ten or a dozen—and their appearance was that of a mixture of fæcal material, blood, and mucus, rather than the "jelly and blood" characteristic of the mild type of the disease. Abdominal distension, tenderness, and rigidity of the muscles on palpation were not present in any of the cases. The spleen was never found to be enlarged on clinical examination.

In two cases only have temperature records been obtainable, and in these the pyrexial reaction was higher (101°–102°) than in the milder type. Drowsiness, passing into coma, has preceded the fatal issue. In general it may be said that these fatal cases have been associated with a degree of toxic infection altogether out of proportion to the symptoms.

Post-mortem Appearances.

Post-mortem examinations which were made in all the fatal cases showed the same general pathological appearances in every case.

In every case there has been an enteritis and a colitis—the former condition predominating. The inflammatory changes have been most marked in the lower one-third of the ileum, though in one case it was the upper part of the jejunum which appeared to be chiefly affected. Engorgement of the blood-vessels in the wall of the gut has been the principal external sign, and the peritoneal reaction has never gone beyond this hyperæmic stage. Internally there has been evidence of a folliculitis, passing on to follicular ulceration. The Peyer's patches in the main have not been affected.

There have been no signs of chronic thickening of the bowel wall, but recent œdematous changes have been constant. The condition of the colon has generally been similar to that of the intestine though in a minor degree. A slight gastritis was present in some of the cases. A presumably acute lymphadenitis of the mesenteric glands was found in one case, and the spleen was definitely enlarged in another. Toxic changes were invariably present in the heart, kidneys, and liver.

The results of the bacteriological examinations of fæces, blood, and post-mortem specimens will be considered later.

Epidemiological Features and Spread of the Disease.

Distribution and Chronology of the Outbreaks.—The 22 cases recorded occurred in 15 separate domiciliary outbreaks. There were ten outbreaks made up of single cases; three multiple groups of two cases each; and two where three patients were affected. The chronological order and date of commencement of each of the outbreaks is given in Table II. Cases and outbreaks occurred in nine of the 19 wards of the city (population 288,500), but although there has been a multiple incidence in certain wards, in no instance have there been two outbreaks in one street. In fact, after the closest investigation and interrogation of all facts and persons concerned, it may be said quite definitely that there has never been any known contact between one affected family and another, either domestically, scholastically, or otherwise.

Water.—The water common to all these cases for the purposes of drinking and ablution was that of the Newcastle and Gateshead Water Company, a supply obtained from upland sources, stored, filtered, and chlorinated. It is usually of high quality judged both by chemical and bacteriological standards. Samples of water taken from each house without sterilisation of the tap were satisfactory in all but five. In three of these *B. coli* were present in 1 c.cm.; in two specimens in 10 c.cm. In no case were streptococci present. Neither the series of outbreaks as a whole, nor any individual focus presented the features of a water-borne epidemic, and in view of this and the known feeble viability of *B. dysenteriæ* under saprophytic conditions, little significance is attached to these findings of dirty waters, though to a certain extent they act as an index of the general hygienic standard of the dwelling.

Milk.—Only in five cases was fresh milk an article of diet in the household. In four cow's milk was used, in the remaining one goat's milk. The milk had been boiled in only one instance. The purveyors of these milks were all different, and as far as could be ascertained the sources of supply were entirely independent. In the remaining cases tinned milks were in regular daily use, and the patronage of the various brands appears to have been very catholic, no fewer than ten different varieties being consumed.

Milk products, &c.—In view of the variety of brands of butter and margarine used there is nothing to suggest their relationship to the outbreaks.

Ice cream.—A history of eating ice-cream was only given in two of the outbreaks. In each of these cases—one of which proved fatal—it had been consumed the day before the sickness commenced, and had been obtained from diverse sources.

Prepared meats.—Brawn, potted meat, galantine, &c., were not eaten by any of the patients affected. Two patients in separate outbreaks gave a history of eating respectively corned beef and tinned tongue. These meats came from different shops, and in both instances were partaken of by others who suffered no ill-effects.

Shell-fish.—One fatal case had a few whelks on the day of the onset of illness. Others similarly indulging in the same and adjacent houses were unaffected.

Watercress, salads, unwashed fruits were not implicated in any of the outbreaks.

Flies were a negligible feature of both domestic and outdoor life during the period under review.

Epizoötics.—Careful inquiry was made as to the degree of rodent infestation of the affected houses. This was negligible, nor was there any evidence of any epizoötic, such as might be shown by the presence of dead rats or mice, or diarrhœic indications of an intestinal complaint.

Sanitary conditions were fairly good. Water-closets were fitted on all the premises, and dry refuse was removed periodically under corporation arrangements.

Contact with other cases or carriers.—As has been stated above, there has been no evidence of any contact between one infected household and another, either directly or through intermediaries. In two instances an apparently healthy member of the household gave a history of a previous attack of dysentery, one in South America in 1913, the other while serving in France in 1916. Neither of these persons had anything to do with the preparation of the family's food, and their stools when examined were negative for the dysentery group.

One incident remains to be recorded for what it is worth. From a small domiciliary group of three cases an agglutinable Sonne dysentery bacillus was isolated. One patient—a boy of 11—died, and the other two, though attacked at the same time, manifested only the very slightest symptoms. About six weeks prior to this a playmate of the boy had died suddenly in the flat above, with symptoms suggestive of dysentery. The macroscopic appearances at post-mortem examination were those of entero-dysentery, but unfortunately the specimens obtained were useless for bacteriological purposes, and accordingly this case has not been included in the present series. The only suggestive facts are that the father of this latter boy had suffered from diarrhœa on the day of his son's death, and that he had but recently returned from Glasgow—a Sonne infected area. His stools when tested at a later date were negative.

Overcrowding.—The houses affected were a rather less than average sample of the dwellings occupied by the working classes of the city. Some were tenement property in comparatively poor neighbourhoods, others were modern habitations recently constructed under corporation town-planning schemes. On a standard of two persons per room, 51 of the total number of 94 inhabitants were overcrowded, a percentage of 54, compared with the average overcrowding of 33·6 per cent., which held in Newcastle at the time of the 1921 census. The relation between overcrowding and the incidence of diseases of the diarrhœa type does not require to be emphasised here.

Climatic conditions.—There was nothing exceptional in the climatic conditions for the time of the year.

Up to this point these cases of bacillary dysentery have been treated as if one, and only one member of that group of organisms had been the cause of the whole series of focal outbreaks. The bacteriological evidence, however, shows that no fewer than five types of dysentery bacilli, or of organisms so closely allied as to be grouped with them, have acted as the "materies morbi" in these cases.

Bacteriological Data.

Only the essential features of these laboratory findings will be recorded here, as they form the material for a bacteriological review of the outbreaks, which is in course of preparation by the investigators concerned.

A brief statement of the standards adopted as diagnostic, and an enumeration and distribution of the organisms implicated, are, however, necessary for the purpose of this article. All examinations of clinical and post-mortem material were carried out in the Routine Department of the University of Durham College of Medicine Bacteriological Laboratory by or under the direction of Dr. F. H. A. Clayton.

1. Every case of dysentery in this series was a positive bacillary case in the sense that (*a*) an undisputed dysentery-causing bacillus was obtained from

its stools, or (*b*) its blood-serum agglutinated not only a standardised emulsion of a dysentery organism, but also an identically similar organism found in the stools of another patient in the same household.

2. As a result of these investigations the following five organisms have been discovered amongst the 22 cases of dysentery :—

(*a*) Three out of the five commonly accepted serological types of *B. dysenteriæ* Flexner—namely, W, Z, and one which agglutinated X and Y strains equally and is in consequence referred to as XY. Type V was not found in the present series.

(*b*) A Sonne bacillus, and an inagglutinable variant of the same.

(*c*) A so-called para-Shiga organism. This designation was applied because it is not agglutinated by Shiga serum, although it shows the fermentation reactions of that organism, causes dysenteric symptoms, and has been isolated from a fatal case. A very similar, if not identical, bacillus was isolated from a case of clinical dysentery in Newcastle in September, 1925, and in May of this year from an outbreak of about 20 mild cases of the disease in the Cripples Home at Gosforth, one mile outside the boundaries of the city. A description of this organism is being published by Dr. Clayton and Dr. S. H. Warren, of the University Laboratory. Neither of these other foci could be associated in any way with the two cases in the present series.

It is important to note that wherever multiple infections have occurred in a household, the type of the causal organism has remained the same for all the cases therein.

TABLE I.

Type of organism.	Flexner.				Para-Shiga.	Sonne.
	V.	W.	XY.	Z.		
Organism isolated from stools	—	3	2	4	—	3*
As above, and agglutinated by patient's own serum ..	—	—	—	2	—	—
Blood-serum, tested against standard Oxford emulsion, and/or organism from case in same household	—	—	—	3	1	—
Organism isolated from P.-M. material	—	1	1	—	1	1
Totals	—	4	3	9	2	4

GRAND TOTAL .. 22 cases in 15 outbreaks.

* 1 inagglutinable.

Flexner W caused 4 outbreaks, XY 2, Z 6, para-Shiga 1, Sonne 2.

Table I. gives the distribution of the five organisms amongst the 22 cases, and also shows the sources from which they were obtained.

Table II. is included as a matter of interest. It shows the chronological order of the 15 outbreaks, their dates, neighbourhood, and the type of the infecting bacilli. It demonstrates, amongst other things, that the first seven outbreaks sprang up in different wards ; that there were never two consecutive outbreaks in the same ward, and where one type of organism was implicated in successive outbreaks the infected localities were, of course, not the same.

The interrelations of the various dysentery bacilli are still somewhat ill-defined. It would appear to be generally accepted that Shiga and Sonne are distinct organisms, with well-marked serological and biological properties which they hand on through many generations. On the other hand, the fermentation reactions of the Flexner group, though of considerable importance, are not quite reliable enough to be used alone for purposes of differentiation. Accordingly, bacteriologists have developed their already considerable knowledge of the more stable distinguishing features of these several organisms, which could be found in their reactions to immune sera. These agglutination tests do not invariably yield clear-cut and definite lines of demarcation between the five or more strains—V, W, X, Y, Z, &c.—into which the Flexner group has been subdivided serologically, but they are sufficient for most practical purposes.

Whether in course of time these serological types alter and change one into another is not known. At any rate in the present investigation wherever multiple cases have occurred in houses there has been no evidence of such transmutation of type. Nor is there any reason to believe that what holds good for these multiple cases does not similarly apply to the single cases throughout the series.

TABLE II.

Serial No.	Ward.	Type of organism.	Date.	Serial No.	Ward.	Type of organism.	Date.
1	F.	Z.	Mar. 2	9	W.	Z.	May 15
2	S.	XY.	,, 24	10	Arm.	Sonne.	,, 20
3	J.	W.	,, 27	11	F.	XY.	,, 31
4	W.	W.	Apr. 25	12	W.	Sonne.	June 5
5	Ben.	Z.	,, 28	13	Ben.	Z.	,, 12
6	Anth.	Z.	,, 28	14	Byk.	Z.	,, 19
7.	And.	W.	May 7	15	W.	Para-Shiga.	,, 29
8	J.	W.	,, 9				

Abbreviations for Wards.—And., St. Andrew's; Anth., St. Anthony's; Arm., Armstrong; Ben., Benwell; Byk., Byker; F., Fenham; J., St. John's; S., Stephenson; W., Westgate.

Discussion.

In considering these 22 cases an attempt was first made to regard them simply as " bacillary dysenteries " without differentiating the type of causal bacillus. For a time it was convenient to imagine them as arising from one source, and following in one sequence. But on further scrutiny not only was it necessary to recognise the diversity of the infecting organisms, but also that there was no definable factor common to all the cases, and that there was nothing wherewith one could connect them together in a consecutive series. Arranged in five groups corresponding to their causal organisms, these outbreaks still failed on the most careful investigation to divulge any other common feature which might facilitate an understanding of the incidence and spread of the disease. And, finally, the attempts made to link up any individual outbreak with another have proved unsuccessful.

Relying on the evidence available, and allowing as auxiliary predisposing factors the obvious overcrowding, and the proved facilities for easy contamination of water and food which arise under these conditions, one is reluctantly compelled to admit that apart from the thesis that these outbreaks of dysentery are certainly a sporadic, and possibly an endemic manifestation of the disease, there is no other explanation easily acceptable at the moment. How exactly the disease arises, and what part intermittent carriers and the even more dangerous latent case, as described by Cunningham, have played in the spread of the disease it is impossible to say. The amount of material at one's disposal is not sufficient. It would appear an entirely feasible hypothesis that in certain cases following upon some dietetic indiscretion, the quiet " carrier " has become actively dangerous, perhaps even personally ill, and that other cases in the same household, some of acute dysentery, others of transient diarrhœa, have been the result. Sporadic dysentery in itself is nothing new ; it has been described in this country by many observers, amongst others by Saundby in Birmingham (1906),[5] Bainbridge and Dudfield in Paddington (1911),[6] and Severn and Evans in Smethwick (1928).[7] The interest of the present series lies in the variety of organisms at work, and in the way in which the sporadic elements have become so frequent as to attain the dimensions of an endemic.

Several questions arise—many of which cannot be answered at the present moment. They are, nevertheless, stimulating in their suggestion of fresh avenues of inquiry. It will be remembered how Creighton pursued the records of dysentery across a century, and found cases which were at one time well and truly recorded as " griping of the guts," later masquerading as "convulsions."[1] And probably in a measure the same is true to-day. Diarrhœa, the "omnibus" diagnosis, has no doubt regained the allegiance of many of the dysenteries, and ulcerative colitis, a comparative newcomer, may have acquired some of the remainder. A search of the death returns for the last six years, under the headings of dysentery, diarrhœa, and the allied diseases, has given for Newcastle a limited amount of "data," which on strict statistical inquiry and analysis may show whether this sporadic or endemic dysentery is a normal feature of life and death in Newcastle. But apart from these retrospective inquiries, extensive observations on normal living material are necessary. What percentage of the ordinary population intermittently excrete dysentery bacilli in their stools? How many people are there with well-marked agglutinins for the dysentery group in their blood? The former percentage would give us some idea of the number and significance of the dysentery carrier; the latter figure should show the extent of past infection. These data have been obtained before but separately, or from communities (e.g., mental hospitals) which cannot be accepted as normal. The work of Schorer,[8] Ritchie,[9] and Pickworth[10] along these lines urgently requires to be extended.

Other questions, not so important perhaps, but equally fascinating come to mind. If this is not a true endemic, is it the beginning of an epidemic? Are these sporadic foci due to five types of bacillus, the first potential centres of an epidemic outbreak? Why should five types of organisms have simultaneously made their presence so manifest? Have these organisms been with us all the time, and is there now some failure of the natural immunity of certain members of the population? Have the protective properties of the bacteriophage become enfeebled? Has there been some transmutation of certain forms of bacterial life? The main object, however, of this article has been to draw attention to the series of cases of dysentery which have occurred in Newcastle, in the hope that other observers may inquire whether such a condition of affairs is present elsewhere.

My acknowledgments and thanks are due to Prof. Harold Kerr, medical officer of health of Newcastle-upon-Tyne, for permission to publish this report, and for much interest and assistance in its preparation.

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BUXTON MEDICAL RESEARCH SOCIETY.—At a meeting held on Sept. 7th at the Devonshire Hospital Mr. J. Race, biochemist to the hospital, communicated the result of an analysis, made by Dr. Judd Lewis, of the gases issuing from St. Anne's Well, showing the rare gases to be 1·20 per cent. of the total volume, made up of argon 96·6 per cent. and helium 3·4 per cent. The absence of neon is an interesting feature of the analysis, as it appeared to exclude atmospheric air as a source of the helium and afforded a sharp contrast with the gas at Bath which, like atmospheric air, contained considerably more neon than helium. The output of radium emanation in the gas had been estimated at 3000 milli-micro curies per hour. Seeds soaked in the radio-active Buxton water germinated quicker and grew more rapidly than in either tap water or in a natural water practically identical in composition with the Buxton water but free from radium. The waters, he said, were all adjusted to the same pH before use.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Unequal Distribution of Doctors.

A RECENT publication shows how many medical men there are in the six central European States which derive all or part of their territory from the old Austro-Hungarian Empire. From the data given, which were compiled for other purposes, the following figures may be quoted as indicating the unequal distribution of practitioners in these countries:—

—	Population.	Practitioners.	No. of inhabitants per practitioner.
Jugoslavia	12,000,000	2100	5700
Roumania.. ..	16,000,000	3000	5300
Poland	7,000,000	2200	3200
Czecho-Slovakia ..	13,500,000	6800	1970
Hungary	8,000,000	5400	1480
Austria	6,500,000	7300	900

This makes it painfully clear that the situation of the medical profession in Austria is worse than in any of the other States; even wealthy Czecho-Slovakia, with more than double our population, has far fewer doctors to compete with one another than there are here. Austria's poverty and economic depression obviously justify the authorities in their endeavour to prevent or diminish the matriculation of medical students.

The Principal Causes of Deaths in Vienna.

From the report of the Vienna Board of Health for the first half of this year it appears that tuberculosis no longer holds first place among the causes of mortality. Pulmonary tubercle—the other forms do not play a significant part in these statistics—was responsible in 1918 for 22·5 per cent. of all deaths in the city, and in 1920 for 18·6; but by 1926 the percentage had fallen to 13·7, and in the past six months it has been only 12·3, which is very gratifying. No doubt the decline is due to the remarkable improvement in housing effected by the present municipal government, and also to instruction of the public concerning the hygienic importance of light and air, and the necessity for isolating phthisical patients. Further, the increase of tuberculosis centres and sanatoriums has a very beneficial effect upon "open" cases. Thus it comes that diseases of the heart and circulation now take precedence over tuberculosis as causes of death. Whilst it is by no means certain that these pathological conditions have absolutely increased in Vienna, their prevalence may be an after-effect of the war, now becoming more distinctly manifest. This is probably true of wear-and-tear diseases such as arterio-sclerosis.

Doppler's Method of Reactivating Viscera.

For some three years, as I have already mentioned,[1] Dr. Karl Doppler has been making extensive use of a method of reorganising visceral blood-supply, based on a technique devised by Leriche for increasing the circulation in paralysed legs. On dividing the sympathetic nerves accompanying the blood-vessels of the limbs, and thus destroying the vaso-constrictor branches, Leriche obtained improvement, albeit temporary, in the circulation, and Doppler's technique is based on his observation that a similar result can be got by painting the adventitia of the blood-vessels with a 7 per cent. solution of phenol. He first tried this method in a case of badly healing gastric ulcer and the result was promptly satisfactory. Then he used it wherever it seemed desirable to stimulate a too sluggish blood-supply, and it is true that he—and many other surgeons who used his carbolic solution—got very good results. Encouraged by these experiments, Doppler started using the method for increasing the blood-supply, and thus promoting the functional activity, of the testes and ovaries. For this process he strictly repudiates any use of the term rejuvenation. He calls it a "regenerative" method, and together with Prof. Hans Lorenz—not the orthopædic surgeon—he has used it in a large number of cases, in which the effect has undoubtedly been very beneficial in certain respects, whilst the operation itself is very simple and easily performed. A distinct return of muscular strength and mental activity, with growth of hair and even return of its normal colour, has been observed by many surgeons. The duration of the effect is not yet known; as a rule, it seems to be two years at least, although sometimes repetition of the operation has been required within that period. There are also, of course, refractory cases, and the treatment cannot be expected to do much good if the organ under stimulation has been irreparably damaged so that its glandular tissue has atrophied. Attempts have so far been made to reactivate the liver, the kidneys, the ovary, and the testes; experiments are now going on with regard to the thyroid and suprarenal glands. The physiological basis of the method is now thoroughly understood. The carbolic solution destroys—much better than a knife—certain nerve-tissues, and at the same time sets up a process which prevents the formation of new nerves after the original destruction, at any rate for two or three years. The 7 per cent. solution acts chiefly on the vaso-constrictors, the vaso-dilators being much more resistant. The method is now being widely tried all over Vienna, but results are not being given to the public as Dr. Doppler wishes to make certain of his facts as far as possible before making further claims.

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[1] THE LANCET, 1928, i., 467.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

A Medical Register for India.

NEWSPAPER reports that the Government of India intend to bring before the forthcoming session of the Central Legislature a Bill to regulate medical education in India by the establishment of a Medical Council and the maintenance of a Medical Register have evoked mild protest from the Bengal Medical Association and one or two other quarters. More than one medical circle has declared that the time has not yet come for the establishment of an Indian Medical Council, and that it would not be easy to control provincial medical councils by a centrally constituted organisation.

The question whether there is need for setting up a central organisation has been engaging the attention of medical faculties and other such associations for at least a decade. Indeed, it has been revived and pressed upon the Government more than once since 1919, but apparently the Government have hitherto not been kindly disposed to the demand. Possibly their want of sympathy was due to the fact that all provincial governments were not of one mind on the question. It has, in fact, been stated in a well-informed quarter that three of the local governments were against the proposal. This, and perhaps the usual financial difficulties, might have stood in the way of the Central Government taking any bold step, but events since then have been distinctly in favour of a definite forward move.

The Bill which has now been prepared by the Government of India can be said to be a comprehensive measure which aims at making India autonomous in regard to medical qualifications based on the Western system. Its object is said to be the creation of a Central Council which will establish a uniform standard of qualification in medicine for all provinces so that holders thereof may be empowered to practise throughout British India, and it will be the sole authority to regulate, on a footing of reciprocity, the conditions on which qualifications acquired abroad are to be recognised in India.

Bengal's Poor Health.

The deterioration of the public health of Bengal is emphasised in a recent address by the Director of Public Health of the province. For this state of affairs improper and inadequate food is largely responsible. The annual mortality for the province is about a million and a half, and deaths of children under the age of 15 make up no less than 50 per cent. of the total. In 1927 no fewer than 120,000 people died of cholera in Bengal; the mortality from malaria was 350,000; reported deaths from enteric vary annually between 50,000 and 100,000, while deaths from tuberculosis total about 100,000. In all probability there are at least half a million sufferers from tuberculosis in the province. The infantile death-rate is appalling, and on the average 55,000 newly-born children die of tetanus every year.

Dangerous Drugs.

There is every likelihood of the Government of India introducing a Bill in the autumn session of the Central Legislature regarding dangerous drugs. This Bill is rendered necessary in view of certain obligations undertaken by the Government under the Geneva Dangerous Drugs Convention of 1925. It is not known at what stage the Bill is now, but it will be published in the *Gazette* shortly before the commencement of the September session. As, however, the measure in its application will concern a large number of provinces in India, it is likely that soon after the introduction in the Legislature a motion will be made for circulating the Bill to local governments for opinion. This means that further progress will not be made till the next winter session in Delhi.

Wild Animals.

The total number of persons returned as killed by wild animals (other than snakes) in British India during the year was 2285, as against 1955 in the previous year and 1962 in 1925. Tigers were responsible for 1033 of these deaths, leopards for 218, wolves for 465, bears for 78, elephants for 56, and hyenas for 12. Deaths were highest from tigers and leopards in Madras, from wolves in the United Provinces, from bears in Bihar and Orissa, and from elephants in Assam. Of 423 deaths from "other animals" about 136 are assigned to crocodiles, 85 to wild boars and pigs, and 41 to jackals. The highest number of deaths from all wild animals occurred in the Madras Presidency (579), the United Provinces, Bihar and Orissa, and the Central Provinces and Berar coming next in order. During the year 25,612 wild animals were reported as having been destroyed, including 1368 tigers, 4390 leopards, 2739 bears, and 2430 wolves.

Deaths from snake-bite decreased from 19,724 to 19,069, the number of snakes destroyed in India proper increasing during the same period from 46,012 to 57,116.

MEDICINE AND THE LAW.

Dangerous Drugs Regulations.

ATTENTION was recently drawn[1] to the Order in Council which at last brought into operation the Dangerous Drugs Act, 1925. That Act provided a new definition of the drugs to which Part III. of the 1920 legislation applied, and another Order in Council of the same date applied Part III. to certain specified preparations. The Home Secretary has now made two sets of regulations dealing with these preparations. The first set regulates the manufacture, supply, possession, &c., of benzoyl-morphine under licence. The other extends the Dangerous Drugs Regulations of 1921 to dihydro-oxycodeinone and dihydrocodeinone and their respective salts, and requires that separate registers (or separate parts of the register) be kept in respect of these preparations. These two recent sets of regulations are what is called Provisional

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[1] THE LANCET, Sept. 1st, p. 475.

Regulations. This name merely implies that, on certified grounds of urgency, the Home Office is entitled to make the regulations without giving the usual 40 days' notice of his intention under Section 1 of the Rules Publication Act of 1893, and without waiting to collect the observations of persons interested upon his proposals. The Provisional Regulations have meanwhile (and until the Regulations are made, after the full preliminaries of notifying intention and collecting criticisms. as Statutory Rules and Orders) just as complete validity as if they were "Statutory" and not "Provisional."

A Promising Advertisement.

A cutting from a Malayan newspaper contains an advertisement (with portrait) of a "Burmese specialist," giving an address in Kuala Lumpur, who, having had 35 years' practice at Rangoon, begs to notify the public that he is able to cure a number of specified diseases. The list ranges from hiccough, hoarseness, and indigestion to madness, paralysis, asthma, and leprosy. "Persons affected with evil spirits or charms could be released; guarantee to cure diabetes within two months." The announcement may not be taken seriously by western readers, but can we say that similar advertisements have entirely disappeared from the columns of English newspapers? Parliament has prohibited them so far as they relate to venereal disease; they might be, though they seldom are, the subject of criminal proceedings in so far as they incite to or abet abortion. Otherwise there is nothing—except the general spread of education—to restrict the advertisement of promised cures. The vendors' descriptions of patent medicines seldom understate their claims.

An Osteopath Prosecuted.

But while an eastern journal publishes such an advertisement, the eastern courts may be found taking proceedings against a development which is entirely western. A Kuala Lumpur newspaper of July 30th records the prosecution and conviction at Colombo of Mrs. Starr for practising osteopathy—or, to be exact, for having during April and May last, practised medicine and surgery for gain without having registered herself as a practitioner under Ordinance 2 of 1905. Mrs. Starr, described as a manipulative therapist, had, it appears, given treatment of a kind associated with the practice of osteopathy. Her counsel argued that the treatment was a sort of massage, neither medicine nor surgery, that massage is not a branch of surgery but an aid to surgery, and that consequently the manipulative treatment given (in the case charged a manipulative treatment of the spine) did not offend against the Ordinance. The magistrate examined various dictionary definitions of osteopathy. He observed that massage was undoubtedly an aid to medicine and surgery, but remarked that osteopaths worked on a different plane. They claimed to diagnose and remedy disease: their methods were more drastic and far-reaching than those of the masseur. The osteopath is not so much a humble auxiliary of the qualified practitioner as a substitute and sometimes even a rival: he is not an assistant but a principal. Osteopathy, said the magistrate, is a particular branch of manipulative surgery: Mrs. Starr practised surgery in administering manipulative treatment. He fined her the nominal sum of 25 rupees, having taken into account the facts that she had practised her profession openly for some years in Colombo and elsewhere without interference or objection, that she was stated to have given relief to certain patients where qualified doctors had failed, and that she might have been legally entitled to practise in other parts of the world, and therefore possibly was unaware of the Ordinance under which she was being prosecuted. The magistrate then added certain general observations of considerable interest. The legal position, he said, seemed to be that the practice of osteopathy was not proscribed in Ceylon, but that only practitioners qualified and registered as physicians and surgeons could practise osteopathy. "I think it would be true to say that the medical profession admits in theory the great value of osteopathy, a branch of manipulative surgery, in the treatment of certain injuries in carefully selected cases: but it is probably also true that no members of the medical profession in Ceylon are qualified osteopaths." The practical result was that, at the moment, if any patient in Ceylon had an ailment which could only be remedied by osteopathic treatment, he or she could not obtain such treatment. There was, however, another important consideration. It had been alleged that Mrs. Starr was treating her patient for infantile paralysis when in fact the ailment was malaria. The judicial medical officer had attested that the patient died of heart failure from excessively high temperature due to malaria. His final pronouncement summed up the position clearly. "What in any event is obvious, is the great danger that exists in allowing a person, unqualified save in one particular branch of surgery, to attempt to diagnose every type of disease and ailment; it is unreasonable to suppose that the one remedy of manipulative surgery is a suitable prescription for every type of disease, and the great danger that lies in the prescription of such a remedy where it is unsuitable is patent."

The Services.

ROYAL NAVAL MEDICAL SERVICE.

H. L. Pridham to be Surg. Lt.

The following appointments have been notified:—Surg. Comdrs.: H. B. Padwick to *President* for post-graduate course; and R. A. W. Ford and J. C. Sinclair to *President* for R.N. Medical Store Depôt, Deptford, for survey of stores. Surg. Lts.: E. J. K. Weeks to *Victory* for R.N. Barracks, Portsmouth; and H. W. Strong to *Fisgard*.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. D. A. Imrie to *Victory* for R.N. Hospital, Haslar, for training.

Surg. Lt. (D.) E. D. Collins to *Virid* for R.N. Barracks, addl. for training.

Surg. Sub-Lt. D. S. Buchanan promoted to Surg. Lt.

Proby. Surg. Sub-Lt. H. E. Holling and R. H. Wheeler to *Victory* for R.N. Hospital, Haslar, for training.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. R. L. V. Foster retires on retd. pay.

Majs. to be Lt.-Cols.: G. S. Wallace, vice Lt.-Col. B. B. Burke, promoted; C. J. Coppinger, vice Lt.-Col. R. L. V. Foster.

W. D. Hughes to be Lt. on prob.

TERRITORIAL ARMY.

Lts. W. S. C. Copeman and K. V. Milburn to be Capts.

ROYAL AIR FORCE.

Flying Officer J. Hutchieson is granted a permanent commission in this rank.

Flight Lt. (Hon. Squadron Leader) G. S. Ware relinquishes his temporary commission on completion of service, and is permitted to retain the honorary rank of Squadron Leader.

DEATHS IN THE SERVICES.

Col. LLEWELLYN THOMAS MANLY NASH, C.M.G., R.A.M.C., retd., who died on Sept. 9th at the Queen Alexandra Military Hospital, Milbank, London, aged 67 years, received his medical education at the Royal College of Surgeons, Ireland, and at the Rotunda Hospital. He was appointed surgeon in the R.A.M.C. in 1885, and served with the Miranzai Expedition in India (mentioned in despatches and medal with clasp) and also with the Hazara Expedition (clasp). He reached the rank of major in 1897, and that of Lt.-Colonel in 1905. In the late war he took command of No. 8 General Hospital at Rouen in August, 1914, and was later A.D.M.S. of the 8th Division (twice mentioned in despatches and created C.M.G.). In 1915 he returned to England, owing to ill-health, and was subsequently appointed to headquarters in the Eastern Command. At the end of 1916 he organised the R.A.M.C. centre at Blackpool with marked success. In 1917 he was appointed A.D.M.S. in Sussex. His genial disposition and tactful manner brought him many friends in civil as well as military life who will deeply regret his death. Col. Nash married in 1901 Edith Gertrude, daughter of the Rev. Charles Sloggett.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT CARDIFF.

(Continued from p. 578.)

SECTION OF LARYNGOLOGY AND OTOLOGY.

CHRONIC ETHMOIDITIS.

Dr. ROSS SKILLERN (Philadelphia), in his opening paper, said that chronic infections of the ethmoid could be broadly divided into suppurative and non-suppurative. With regard to the suppurative variety, the exudate varied from a thin watery to a thick yellow discharge, and this variation occurring in the same case, while the patient attributed it to the acquisition of fresh colds, was really due to exacerbations of his chronic condition. The discharge at times became so thin and scanty as to lead the patient to believe that a cure was in process. The final result, however, was a constant purulent secretion.

The *non-suppurative type* was characterised by polypoid formations unaccompanied by true leucocytic pus. This hyperplastic ethmoiditis, while distinct pathologically from the suppurative variety, did not preclude a combination of both types. In fact, the probability of suppuration was in direct proportion to the extent of hyperplasia. Saprophytes were more likely to find a suitable growth medium when polyposis was present. The *suppurative type* might be subdivided into suppuration affecting the anterior cells or the posterior or a combined suppuration of anterior and posterior. Suppuration of the anterior cells as an individual entity did not exist save with one exception. He had not seen this condition apart from accompanying affection of the frontal sinus. The exception referred to was infection of the bulla ethmoidalis, and even then an abscessed bulla was often associated with infection of other cells. Infection of the posterior cells was more frequent, because they were larger and more numerous, and they were so situated as to be less amenable to aeration. Their drainage could easily be interfered with by a slight swelling of the mucosa and their situation prevented easy exact diagnostic instrumentation. So slightly were they disturbed by inspiratory air currents that they offered an excellent medium for microbic growth. The combined anterior and posterior infection was usually an acute infection in contra-distinction to the gradual insidious infection of the separate anterior or posterior cell types. The *hyperplastic types* varied from a slight degeneration of the lower border of the middle turbinate, to the formation of large sessile polypi. Actual polypi appeared to originate from the body of the ethmoid or the uncinate process. He had never seen a large polyp originating from the lower border of the middle turbinate. The anterior labyrinth was the seat of large extracellular hypertrophies, while in the posterior labyrinth the intracellular variety was the rule. The so-called choanal polyp sprang from the mucosa of the maxillary antrum. In old chronic cases the entire ethmoid became converted into one mass of polypoid degeneration. In such cases there was a profuse watery secretion, which did not stain linen. Staphylococcic infections appearing in cycles produced thick yellow secretions. The true combined form only became permanent when the organisms found lodgment deep in the mucosa.

Treatment had for its basic principles aeration and drainage. Complete removal of all infected tissue was unnecessary. At one time he was prone to overdo the removal. Drainage was the duty, while ventilation, although desirable, was not indispensable. Ofttimes haphazard procedures only left an area of debris, which degenerated into a disorganised suppurating mass. In simple catarrhal infection, removal of the middle turbinate was almost a sine qua non; first, to permit thorough aeration, and secondly to make possible the application of medicaments. In some cases he had found it necessary to resect part of the septum, so that the middle turbinate could no longer swell and compress the ethmoid. Five days after removal of the turbinate tampon treatment was instituted. Cotton tampons saturated with a 10 to 20 per cent. silver preparation, dissolved in equal parts of water and glycerine, were used and allowed to remain in situ at least five hours. The solution should be warm and freshly made. The tampons at first were used every other day, and later with decreasing frequency. Suppuration in the anterior cells often required that the frontal sinus should be cleared of infection. An abscessed bulla could be treated by opening its floor. Suppuration in the posterior cells was difficult to detect even with the nasopharyngoscope, but one clue was always at hand and that was the hypertrophied and mottled appearance of the middle turbinate. In treatment the middle turbinate should be removed, and obviously diseased cells should be opened up, following which the tampon treatment should be carried out. Suppuration of the entire labyrinth required a complete exenteration. In doing so, the preliminary removal of the uncinate process with a flat chisel was advisable. After this had been done the posterior cells could be methodically resected. It was well to leave that part of the inner wall of the ethmoid which housed the olfactory nerve filaments. This was done rather to preserve the sense of smell than to obviate the development of meningitis via the cut filaments. Silver tampons as an after-treatment were admirable.

Treatment of Hyperplastic Ethmoiditis.—Localised hyperplasia (polypi) was treated with a snare, and it was strongly advisable to resect the bony attachment of the polyp. In generalised hyperplasia of the anterior and posterior labyrinths, complete removal, as far as possible, of the degenerated tissue was called for. Here the Mosher and Sluder operations were indicated. Intranasal operations demanded an intimate knowledge of anatomy, but even so there was no anatomical configuration of the ethmoid cells to constitute a normal model. In consequence of these variations, certain deep-lying cells often escaped attention, and that was why the ultimate results were not all good. Nevertheless, he was convinced that the intranasal operation offered the least dangerous, if not the most facile, opportunity to the patient for relieving him of his distressing and ofttimes dangerous infection.

Mr. W. G. HOWARTH (London) classified chronic ethmoiditis into catarrhal and suppurative varieties. He was of opinion that the catarrhal type in its early stages might respond to treatment by simple lavage and hygienic measures, but these were of little use if there was deep infection. He emphasised the importance of aeration and drainage and strongly advised the removal of the middle turbinate. The suppurative variety might be treated by morcellement of the cells after preliminary removal of the turbinate, but he thought the labyrinth could not thoroughly be cleared out by an intranasal operation. He preferred to approach it via the extranasal route, which he had used for 15 years. It gave a better approach to the ethmoid and was not dangerous. Even this method, however, did not expose all the ethmoid cells in certain cases.

The PRESIDENT (Dr. D. R. Paterson, Cardiff) made a plea for conservative treatment. He mentioned cases in which, for various reasons, radical measures had not been attempted. These cases had been treated along conservative lines, such as the periodic removal of polypi for many years. Looking back on these cases he had no reason to be dissatisfied with the results.

Mr. E. B. WAGGETT (London) thought that antritis usually coexisted with ethmoiditis, and that failure to cure the antral trouble was due, in many cases, to an infected bulla. Snipping off the bulla was always worth while.

Mr. HERBERT TILLEY (London) stressed the importance of the use of the endoscope as a means of diagnosis. The antra should be explored in every case of chronic catarrh. He thought there were cases of ethmoiditis in which neither suppuration nor polypoid formation occurred.

Dr. WILLIAM HILL (London) spoke of the difficulty of complete exenteration of the labyrinth, and pointed out the difficulty of dealing with cells extending into the wings of the sphenoid. He did not advocate the routine use of multiple exploration punctures.

Dr. P. WATSON-WILLIAMS (Bristol) said that while the suppurative and non-suppurative varieties were clinical entities, they were but expressions of the same pathological process. The variations depended upon the virulence of the infecting organisms and the patient's own resistance. He suggested the use of vaccines on tampons, and to this end specimens of pus should be obtained by means of suitable cannulæ. With regard to operative measures, he favoured intranasal methods. The middle turbinate should be conserved as far as possible. It at least served as a guide for the removal of the ethmoid cells.

Mr. W. S. SYME (Glasgow) believed that ethmoidal disease was often more extensive than it at first sight appeared. Exploration of the antra was essential, and in most cases an intranasal operation sufficed.

Mr. C. A. SCOTT RIDOUT (Portsmouth) advocated the external nasal operation. He pointed out the frequency of pain between the eyes in infection of the posterior ethmoid cells.

Mr. J. B. HORGAN (Cork) believed in mutiple explorations, and recommended approach to the ethmoid cells via the antrum. He had found iodised phenol of service in cases where the capsule of the ethmoid had been broken into during operations.

Dr. G. M. COATES (Philadelphia) referred to the use of vaccines in chronic infection. American practice did not place any great reliance on their virtues.

Dr. LOGAN TURNER (Edinburgh) expressed the opinion that the external operation was based on sound surgical principles. While meningitis resulting from infection conveyed along the olfactory nerve filaments could not be very common, it did undoubtedly occur. Specimens illustrating it could be seen in the Edinburgh Museum.

Dr. SKILLERN, in reply to a question, stated his preference for local anæsthesia.

Dr. WATSON-WILLIAMS read a paper on a case of Optic Neuritis due to Sphenoidal Sinusitis, which was treated by differential exploration. He pointed out that anatomical variations of the sinuses frequently made diagnosis difficult. In his case the patient had a true undeveloped left sphenoidal sinus. This had become infected and the patient had developed optic neuritis. The infected sinus was found by a process of differential diagnosis, in which cannulæ were used. The method of use was demonstrated by lantern slides. He mentioned that the patient's optic neuritis had much improved when he was subsequently examined by Dr. D. Leighton Davies.

DRAINAGE OF BRAIN ABSCESS.

Sir PERCY SARGENT, in opening the discussion, referred to the special features of brain abscesses. These were the type of tissue involved, the presence of cerebro-spinal fluid, and the pressure conditions within the cranial cavity. There was also the frequent coexistence of other conditions to be considered—e.g., meningitis, ventricular ependymitis, and sinus phlebitis. Four types of abscesses could be recognised: (1) diffuse septic softening; (2) a pus-containing cavity with a ragged wall; (3) a cavity with a thin capsule of young fibrous tissue; (4) a cavity contained by dense fibrous tissue perhaps an inch in thickness. In the first variety, which was really not an abscess at all, no surgical treatment was likely to be of any use, save perhaps simple decompression. In the second class drainage might be successful. The third and fourth types differing only in the thickness of the capsule, merged imperceptibly into one another. Around the thin-walled abscess there was an area of œdematous brain along which extension might take place and by which route the ventricle might become involved. In the thick-walled abscess the changes in the surrounding brain were insignificant. Their proper treatment was complete enucleation followed by closure of the wound without drainage.

The commonest type of abscess was probably that represented by Type 3. Most of these were of otitic origin and situated in the temporal lobe or cerebellum. Cerebellar cases, because they usually gave earlier indications of their presence, were more likely to be operated upon at an earlier stage. He commented upon Macewen's series of cases and his astonishingly low mortality-rate. This latter, he thought, was due to the fact that Macewen's cases consisted of definitely encapsulated abscesses with a long history. These cases did not lend any support for early operation, but in the speaker's opinion early operation ought to be undertaken as soon as an abscess was diagnosed. The dangers of delay were: rupture into the ventricle, acute spreading œdema, and, especially in cerebellar abscess, sudden respiratory failure.

If an abscess were imperfectly drained, the ventricle which contained fluid under pressure might rupture into the abscess and lead to the escape of cerebro-spinal fluid from the wound. If properly drained, the intracranial pressure fell. The appearance of a fungus cerebri—i.e., a protruding mass of strangulated necrotic tissue—was indicative of unrelieved pressure. The route of approach and the method of drainage were of prime importance. The "stalk" of the abscess, representing the inward track of infection, was the ideal route of approach. In otitic cases during a mastoid operation the "stalk" might fortunately be found, and it was possible that the drainage thereby established might be adequate.

Failing the finding of the "stalk" a transarachnoid route must be used. After the skull had been opened the subarachnoid space should be packed off with gauze before the pus was evacuated. This guarding plug might be left in for two or three days.

A subcortical abscess was usually indicated by bulging of the brain with pallor and broadening of the convolutions. These appearances were lacking in deep-seated abscess, and exploration with the trocar and cannula was to be deprecated. He was accustomed to use a small flat seeker, with which the resistance of an abscess wall could be felt. Having located the abscess he tied off all necessary cortical vessels, and then he incised the abscess with a knife. The material of the drainage-tube was of little importance provided it was sufficiently rigid. He had used aluminium and celluloid tubes. The tube should be sutured to the dura or skin and kept clean by syringing. It should be shortened very gradually, and there was always a tendency for some œdema to push it out. This could be tided over by lumbar puncture.

Mr. SYDNEY R. SCOTT (London) spoke of the routes of infection in brain abscesses of otogenic origin. A cerebral abscess might develop via the tegmental, the labyrinthine, or the venous route, and cerebellar abscesses originated from the antrum, the sigmoid sinus, or the labyrinth. Regarding methods of opening the skull, he preferred the use of a broad sharp gouge and a heavy hammer. The gouge should be used parallel to the surface. He deprecated the use of blunt probes in the case of acute abscess. A short pointed knife was advisable. If thick pus was present a dilating forceps was useful. For enucleation purposes he used a spoon and forceps. Drainage was not always necessary as in the case of a small superficial abscess. He said that the use of a suction apparatus was sometimes desirable, but demanded great care. In concluding, he spoke of the value of manometric records as an aid in controlling pressure.

Dr. E. D. D. DAVIES (Stonehouse) pointed out that drains might sometimes be harmful. They might be a source of trauma or secondary infection.

Mr. E. B. WAGGETT (London) suggested exploration with the finger. Once the abscess had been located by an instrument, the latter should not be removed until the drain had been inserted.

Dr. **William Hill** asked why the prognosis of frontal abscess was so bad compared with that of temporo-sphenoidal abscess.

Mr. **Hugh E. Jones** (Liverpool) thought that possibly the close relationship of the anterior horn of the ventricle to a frontal abscess was the explanation. He raised the question of ventricular drainage, where drainage of the abscess was not enough.

Mr. T. R. **Rodger** (Hull) suggested that it might be advisable to delay operation on a cerebral abscess so as to permit of encapsulation.

Dr. **Coates** (Philadelphia) said that the mortality-rates in his country were approximately equal to those in this. He disliked rapid drainage.

Sir **Percy Sargent**, in reply, spoke of the size of the cranial opening. It should always be of sufficient size, a mere trephine opening was not sufficient. A contralateral decompression was of use for the relief of pressure. Ventricular puncture, while useful, was transient in its effects. Hypertonic saline injections were efficacious, but their effects should be carefully watched, for there was a danger of the brain falling away and thereby opening up adhesions. He had no experience of a two-stage operation, nor of gauze drainage, and the latter might be harmful.

Injuries of the Ear arising from Fracture of the Skull.

Dr. E. D. D. **Davies** remarked that in view of the increasing frequency of motor and street accidents, the aurist's point of view was of particular importance. The aurist was usually called in some weeks after the accident to treat deafness, or in connexion with compensation matters. He would be able to give a more accurate estimation of the damage, and treatment might be facilitated, if he were called in soon after the occurrence. Most fractures of the base involved the middle fossa, and this was to be expected, since a line of weakness extended through both Glaserian fissures and the Eustachian tubes to the foramina lacera media, between which was the sphenoidal sinus. The halves of the skull were more or less cemented together by the basi-occipital and the basi-sphenoid, and the fracture usually followed this weak line. The roof of the tensor tympani canal and Eustachian tube and that of the tympanum and antrum were usually involved in fractures along this line.

The extent of the injury varied with the violence, and the site where the blow was applied. Spicules of bone from the tegmen were sometimes found in the auditory meatus. The middle ear was almost always damaged in surviving cases, while the internal ear was rarely fractured. The external meatus was often fractured when the line was through the Glaserian fissure. It appeared to split longitudinally into an upper and lower half. (A specimen showing this was exhibited.) A crack in the roof of the meatus was more common. Where great force was applied, the fracture might extend from the upper or anterior surface of the petrous bone into the internal meatus. A smashing blow might knock off the mastoid and injure the lateral sinus. Fractures of the posterior fossa began in the cerebellar fossa, radiated into the sinus groove of the same side, and then passed either along the inferior petrosal sinus groove or across the petrous pyramid, through the cancellous bone surrounding the antrum and semicircular canals and behind and external to the internal meatus. A blow on the temporal fossa had cracked the roof of the middle ear, and blood had escaped into the tympanum without rupturing the drum. No blood was found in the meatus, but the drum had a bluish appearance. In four such cases the only indication was deafness, and the injury would not have been detected without an aural examination. In such cases posterior rhinoscopy would occasionally show blood in the orifice of the Eustachian tube. Hearing was completely recovered in these four cases in three weeks. Usually, however, the upper half of the drum was ruptured, and blood escaped into the auditory meatus. Leaking of cerebro-spinal fluid indicated the opening-up of the subarachnoid space, and all such cases he had seen had been fatal. Cerebro-spinal fluid also escaped in fractures involving the internal ear.

Profuse and prolonged bleeding from the ear pointed to rupture of the middle meningeal artery or the lateral sinus, and urgent operation was called for. The meatus was sometimes a vent for extradural hæmorrhage and ought never to be firmly plugged. The lateral sinus was rarely ruptured, and the increased intracranial pressure sufficed to arrest bleeding. Hæmorrhage from both ears had a mortality of 66 per cent., while from one ear it was 39 per cent. The average mortality of all cases of fractured base was about 40 per cent.

The presence of pre-existing middle-ear suppuration made meningeal infection very probable. Local suppuration sometimes followed the injury, and materially added to the damage. Mastoid suppuration occasionally followed a fracture, and was liable to lead to meningitis. Some cases of local suppuration, if seen late, could not be distinguished from ordinary chronic middle-ear suppuration, hence the importance of examination soon after the accident. In compensation cases the history of absence of deafness and ear disease previous to the injury should be carefully verified.

Facial paralysis occurred in abour 46 per cent. of fractures of the middle fossa. In a few cases the eighth nerve was involved as well. The facial nerve was injured in the facial canal, particularly near the geniculate ganglion. Paralysis set in almost immediately, save in some cases where it was due to hæmorrhage into the canal. Recovery in these latter cases was more rapid. All cases he had seen had recovered, even after long intervals.

The degree of deafness arising from fractures was very variable. Some showed no deafness. A case seen 12 months after injury, in which the sixth, the seventh, and part of the third nerve had been paralysed, revealed only slight middle-ear deafness. Suppurative cases suffered most loss of hearing, and this loss became permanent. Any improvement which occurred usually took place within eight weeks of the injury. He had not seen genuine ear deafness arising from concussion alone, or from a fracture showing the signs he had described. Probably all subjects of injury to the internal ear died.

The treatment was not always masterly inactivity, and a watch should be kept for the onset of suppuration. Absolute rest in bed for a long period was essential, and the less done to the ear the better. The head should be raised. The meatus should be gently cleansed with spirit, and sterile wool frequently changed should be placed lightly in the orifice. If there was a discharge of cerebro-spinal fluid, the skin should be dried and smeared with antiseptic ointment. Packing with gauze, syringing, and the use of drops were to be deprecated. If suppuration arose, free drainage should be established. The drum should be incised if necessary, and a simple mastoid operation should be carried out at the slightest indication. The operation should be done gently, and preferably by burr or drill to avoid the jarring of the mallet and chisel. Early recognition and treatment of suppuration were essential, to prevent meningeal or intracranial infection.

SECTION OF HISTORY OF MEDICINE.

Nature and Treatment of Dropsy.

Mr. **Walter G. Spencer** presiding, Dr. J. D. **Comrie** (Edinburgh) discussed the historical aspect of ideas regarding the nature and treatment of dropsy. From the earliest times, he said, dropsy was recognised as a morbid condition and was for long regarded as a disease sui generis due to liquefaction of the tissues. The ancient Greek physicians attributed it chiefly to a disorder of the liver, and hardening of the organ was regarded as the principal cause by the Alexandrian school of medicine. Galen regarded the defective action of the heart which was often an accompaniment of dropsy as an effect rather than a cause. In the eighteenth century Morgagni drew attention to the frequency with which the heart was found to show valvular defects and other disorders in cases of dropsy, but did not carry the matter further. Withering, who introduced the use of digitalis in 1775, recognised that only certain cases of dropsy were amenable to treatment by the drug. He described as the type of case in which the dropsy was chiefly benefited persons showing symptoms which were now recognisable as being those of advanced cardiac disease, although the means of diagnosing valvular disorder were not at the time available to Withering. In the beginning of the nineteenth century Corvisart followed by Laënnec placed the diagnosis of cardiac disease on a sure foundation and showed that dropsy was frequently simply a sequel of this type of disease. The recognition of kidney disease as a cause of dropsy was first made early in the nineteenth century when Wells, Blackall, and others pointed out the fact that the presence of albumin in the urine was a prominent feature in certain dropsical cases, and these observations were placed on a sure footing by Bright in 1827. A further group of cases in which neither the heart nor the kidney was found to be at fault was demonstrated by Gull and Ord in the seventies of last century to be due to atrophy of the thyroid gland and to be of a different nature from simple watery œdema.

The PRESIDENT dealt with the surgical aspects of dropsy, particularly omentopexy.—Prof. J. A. NIXON sketched the history of war œdema or famine œdema, the first reference to which was to be found in Hesiod's "Works and Days."

WELSH PHYSICIANS AND THE RENAISSANCE.

Dr. E. ROLAND WILLIAMS (Maenchochog) gave an account of those Welsh physicians of the sixteenth century who had claims to be remembered not only as physicians but also as pioneers of the new learning in other fields of knowledge. The earliest and greatest of these was Robert Recorde, of Tenby (1510–58), who was not only a physician of repute but also one of the great mathematicians of the sixteenth century. To him was due the invention of the sign of equality (=) and the popularisation of the signs plus (+) and minus (–). He was the author of a treatise on anatomy and of "The Urinal of Physick," which laid down the classical canon of uroscopy. Humphrey Llwyd, of Denbigh (1527–68), was another physician notable for the breadth of his culture and his pioneer work in new fields of knowledge. He was the author of "The Judgment of Urine," published posthumously in 1553, which was a kind of therapeutic index and guide to dispensing. Llwyd was devoted to music and was an industrious and erudite writer on Welsh history and antiquities, but his work on geography formed his chief contribution to the new learning. Many prints of his maps were still extant. One of the early translators of the classics into English was the physician. Thomas Phaer, who rendered nine books of the Æneid into English verse and was also the author of two medical works. "A Goodly Brief Treatise of the Pestilence" and the "Regimen of Health." Several of the contemporary Welsh grammarians were physicians who sought relaxations from the cares of practice in what one of them called "the anatomy of language." The most picturesque, typical, and learned of these was John Dafydd Rhys, of Llanfaethlu, in Anglesey, who graduated as doctor of physic at Sienna and wrote two grammatical treatises in Italian, one being an "Introduction to the Study of Latin" and the other a "Guide to the Pronunciation of Italian." He subsequently returned to Wales and practised in Brecknockshire where he died in 1609. During the last period of his life he wrote a Latin treatise on Welsh grammar and prosody, and published a Welsh translation of Aristotle's metaphysics.

Dr. J. D. ROLLESTON (London) emphasised the importance of Thomas Phaer whom Prof. J. Ruhräh had called "the father of British pediatrics."

HISTORY OF SCARLET FEVER.

Dr. Rolleston said that not only in the remote past but until comparatively recent times it was often almost impossible to disentangle the history of scarlet fever from that of other acute exanthemata, especially measles and erysipelas on the one hand, and diphtheria on the other. An attempt had been made by some writers to trace back the history of scarlet fever to classical antiquity and even to identify it with the pestilence at Athens in 430 B.C. Some passages in Hippocrates had given rise to the belief that the father of medicine was familiar with scarlet fever, as he described an illness accompanied by a severe sore-throat though he made no mention of a rash. The mere existence of ulcers on the tonsils, however, did not justify the diagnosis of non-eruptive scarlet fever. The same objection applied to passages in Celsus, Caelius Aurelianus, Aretæus of Cappadocia, and Aetius of Amida supposed to refer to scarlet fever, whereas diphtheria was probably the disease in question.

The Arabian physicians such as Avicenna, Ali Abbas, and Rhazes had also been credited with allusions to scarlet fever, but their descriptions were too vague to be interpreted as such. The first undoubted reference to scarlet fever in medical literature was made by Ingrassias (1510–80), who, in a work published at Naples in 1553, described a disease popularly known as Rossalia, or Rosania, which he distinguished from measles. The next most important writer on scarlet fever was Baillou (Ballonius) who, under the title of Rubiolae, described the principal varieties of the disease from his observations on a severe epidemic in Paris in the winter of 1574–75. Jean Cottyar, of Poitiers, a contemporary of Baillou, also gave an account of the disease under the name of "febris purpura epidemialis et contagiosa." A much more important writer was Daniel Sennert (1572–1637), who was the first to describe scarlatinal desquamation, the early arthritis, and post-scarlatinal dropsy and ascites. The epidemic which he observed at Wittenburg was severe and often fatal, and convalescence was protracted. Sennert's son-in-law, Michael Doering, observed an epidemic in Poland in 1625 and also noted the desquamation, rheumatoid pain, and anasarca as well as the inflammation of the tonsils and surrounding parts.

The term scarlatina was generally supposed to have been first introduced into medical literature by Sydenham, who published his brief account of the disease in 1683, six years before his death. The mild character of scarlet fever at that time was shown not only by his statement that it was hardly worthy the name of a disease, but also by his omitting any mention of the sore-throat or of the complications of rheumatism and dropsy described by his predecessors. In spite of his inadequate description. Sydenham was to be credited with having established the autonomy of the disease and given it a name to distinguish it from the other acute exanthemata, especially measles. His contemporary, Richard Morton, however, maintained that scarlet fever and measles were exactly the same, although unlike Sydenham he described a malignant as well as a mild form and expressly mentioned inflammation of the fauces in the acute stage and alluded to dropsy and ascites as sequelæ. He was also the first writer to mention the occurrence of scarlatinal otitis. In spite of Morton, Sydenham's distinction of scarlet fever from measles was accepted by subsequent writers.

The occurrence of scarlet fever in Scotland was first described by Sir Robert Sibbald, physician to Charles II. and President of the Royal College of Physicians of Edinburgh, in his work "Scotia Illustrata," published in 1684. During the eighteenth century numerous epidemics occurred throughout Europe and the United States and were described by Huxham, Fothergill, and Withering in England, Storch and Zimmermann in Germany, Plenciz in Austria, De Haen in Holland, Rosen von Rosenstein in Sweden, Tissot in Switzerland, and Benjamin

Rush in the United States, where the disease first appeared in 1735. During the eighteenth century there was a tendency to confuse scarlet fever with angina maligna, which was not finally established as a distinct disease until 1821 when Bretonneau gave it the name of "diphthérite." During the last 30 years of the eighteenth century there was a considerable increase in the incidence of scarlet fever, epidemics of which occurred in England, France, Germany, Italy, Holland, Sweden, Denmark, and North America. The epidemics were mostly mild, but one in central Germany, which lasted from 1795 to 1805, was attended by an unusually high mortality.

At the commencement of the nineteenth century malignant and extensive epidemics were followed by periods of lesser prevalence and low mortality, as shown by the experience of Graves in Dublin and Bretonneau in Tours, who differentiated scarlatinal angina from diphtheria. His doctrines were developed by Trousseau, who drew attention to the characteristic tachycardia and frequent occurrence of miliaria, and gave an account of the "formes frustes" (defaced types) of the disease. In the course of the nineteenth century several parts of the world which had hitherto escaped received their first visitation of the disease, such as Madeira (1806), South America (1829), Greenland (1847), Australia and New Zealand (1848), and California (1849). The mortality from scarlet fever in England was very high for at least 50 years after the introduction of registration in 1838, the maximum being reached in 1863. During the last 50 years the mortality had shown a steady decline in England in striking contrast with that in Eastern Europe, especially Poland, Bulgaria, and Roumania.

In conclusion Dr. Rolleston alluded to the advances in our knowledge of the ætiology, prophylaxis, and treatment of scarlet fever since the war.

Welsh Physicians in the Middle Ages.

Dr. P. **Diverres** (Swansea) said that the first medical treatise in Welsh known as the Meddygon Myddfai (the physicians of Myddfai) was probably composed in the thirteenth century. The compiler did not make use of folk medicine, but borrowed freely from Latin authors of repute in that line and in particular from the Secretum Secretorum. With the exception of the Welsh Laws references to physicians were very scanty in mediæval Welsh literature. There were, he said, no allusions to a school of medicine such as existed in the Middle Ages on the continent, but he believed that each physician trained some pupils who were often, perhaps in most cases, his sons or near relations. It was noteworthy that Gerald, the Welshman whose work was so full of interesting details, made no mention of physicians—an omission not likely to have occurred if medical practitioners had been numerous in his time. The Welsh Laws, which in their present state dated from the thirteenth century, only mentioned the Court Physician who was one of the 24 officers of the Court. He was one of the three persons allowed to have private intercourse with the King without the presence of the judge of the palace. He was never allowed to leave the palace without the King's permission. He was expected to give his professional attendance gratuitously to all the officers of the palace, receiving only by way of fees the blood-stained clothes of the patient. If, however, he had to attend to one of the three deadly wounds (blow on the head penetrating the brain, stab in the body penetrating the intestines, and fracture of one of the four limbs) he was to receive one pound without his food or nine score pence with his victuals. In war time the Court Physician was obliged to accompany the armies. According to contemporary medical texts most diseases were treated with remedies made of herbs, but in some cases other kinds of treatment were known such as ligatures, cauteries, and baths.

History and Lore of Cinchona.

Mr. C. J. S. **Thompson** (London) discussed the history of cinchona during the past 300 years from the traditional, the empirical, and the chemical aspects. He dismissed as unfounded the stories told by Geoffroy and La Condamine of the discovery of the febrifuge properties of cinchona by natives. The first authenticated record of the therapeutic value of cinchona bark was in 1638, when the wife of the fourth Count of Cinchon and Viceroy of Peru contracted intermittent fever and made a rapid and complete recovery after taking powdered bark which had been sent her by the Corregidor of Loxa who had himself been cured of an attack by this drug. When the Countess returned to Spain in 1640 she took with her a quantity of bark which she distributed among those suffering from fever on her husband's estates. In 1653 Chifflet, physician to the Archduke Leopold of Austria, wrote a report on the drug and its introduction into Europe. Contemporary physicians differed as to its value. Although many admitted that it palliated the fever, they insisted that it "fixed the humour," thus causing a relapse of some other dangerous disease. It was known at the time as *pulvis Jesuiticus* because the Jesuit fathers used to administer it, or more commonly as *pulvis Peruanus*. In 1670 the Jesuit fathers in Peru sent considerable supplies to Rome, where the methods for using it were explained to a congress of Jesuits. The bark was first known in England in 1655. Brady, then professor of physic at Cambridge, was one of the first to prescribe it, but its general introduction was largely due to Robert Talbor, who made his name and fortune by exploiting it as a secret remedy. In 1677 Peruvian bark first appeared officially in the London Pharmacopœia under the name of Cortex Peruanus. Until the beginning of the nineteenth century cinchona was still used in the crude state, and it was not until 1810 that Gomez, of Lisbon, obtained the acute principles of cinchona, the basic properties of which he called "cinchonino." In 1820 Pelletier and Caventou showed that cinchonino consisted of two distinct alkaloids, one of which they called quinine and the other cinchonine. In 1833 Henry and Delandre isolated quinidine, in 1844 Winckler discovered cinchonidine, and Pasteur produced the alkaloidal derivatives, cinchonicine and quinicine. Since the discovery of quinine 30 alkaloids have been found to occur naturally in cinchona bark, and from these there had been many derivatives.

SECTION OF TROPICAL MEDICINE.

Human Helminthiasis.

Dr. P. H. **Manson-Bahr** presiding, Lieut.-Colonel **Clayton Lane** read a paper on recent advances in the diagnosis and treatment of human helminthiasis. He dealt with the various fæcal egg-counting methods which, for estimating the output of helminth eggs, dated from 1885, and for the control of diagnostic techniques and the estimation of the extent and degree of individual infection in a community from 1918. The means used, he said, should fit the end in view; the diagnostic technique of direct centrifugal floatation (D.C.F.) could detect the presence of a single female hookworm normally ovipositing, was the only technique capable of mass usage, and was the simplest, most rapid, and most accurate available for hookworm, and probably for other common nematode infections where eggs appear in a host's fæces. It fulfilled an aim he had set before himself over ten years ago and since steadily pursued. Diagnosis by culture and extraction of hookworm larvæ was untrustworthy and might well miss the most active, and therefore most dangerous, larvæ. Trapped cultures must be used. "Creeping eruption" probably indicated intradermal wandering of a larva in an uncongenial host.

The principle of the Casoni skin sensitisation reaction for hydatid had, said Dr. Lane, been applied by Fülleborn to strongyloides infection, where it was invariably positive if the infection had lasted more than 18 months. Positive reactions with ascaris antigen appeared to be independent of ascaris infection. Hamilton Fairley had shown that complement deviation had marked value as a test for hydatid and schistosome infections. In appraising the damage done by infection arbitrary selection of tests was worthless. Tests must be such as really measured any disability produced. The most promising and controllable were those which dealt with the same persons before and after disinfestation, and there was reassuring evidence that such tests, dealing with general mortality, morbidity, and wage-earning capacity, were coming into their own again.

In treatment the perfect anthelminthic was yet to seek. The value of intravenous emetine and tartar emetic in schistosomiasis was established; yet Hamilton Fairley had shown that they were not parasiticidal in themselves, but were changed in the body into something which was; similarly, santonin appeared not to be toxic to ascaris, but to become so under the action of bile. Allusion was made to the persisting and lethal error which confused Schüffner's advocated dosage for oil of chenopodium of 48 drops from the international dropper, or 1·2 c.cm., with 48 minims or 3 c.cm. As to carbon tetrachloride, the drug with "no lethal dose," which was claimed to cause, in every million, but a few deaths, "and those among the ones who could best be spared," it was pointed out that, while 3 c.cm. was the advocated dose, death had followed 1·5 c.cm. of the pure drug, and sometimes many deaths. The precautions now advocated as possibly effective in preventing these deaths precluded the employment of the drug on a mass scale.

Dr. Lane drew a sharp contrast between mass treatment, which implied previous individual diagnosis, and herd treatment which "drenched" men promiscuously like cattle, and it was urged that since D.C.F. permitted four men to make an individual diagnosis regarding hookworm infection at the rate of a quarter of a million specimens or more yearly, herd treatment had no justification in morality, science, or expediency. If for the purposes of herd treatment there were adopted a drug, unforeseeably deadly in less than the advocated dosage, the advocated precautions against whose lethalness were inapplicable in herd conditions, then such adoption must in future imply disregard of professional obligations to those treated and deliberate pursuance of a course devoid alike of reason and humanity.

Discussion.

The President said he had found in the long-needed accuracy of diagnosis now afforded by D.C.F. a valuable clinical advance, for his clinical experience was positive that no infection with ankylostomes, however small, should be neglected on its own account or as an important because] harmful complication in other diseases. In his own hands, under conditions obtaining in hospital in England, carbon tetrachloride had proved a safe and effective drug in scores of cases of hookworm infection. There was, however, great need of standardisation of anthelminthics.

Prof. E. Hindle had noted, as a result of periodical examination of fæces of unselected patients in Cairo, that many got rid naturally of their hookworm infestation without any treatment. Prevention of reinfection was therefore of chief importance.

Dr. C. M. Wenyon thought that the main objection to herd treatment without diagnosis appeared to lie in the unforeseeable lethalness of one of the drugs used. Discovery of a safer, yet effective, anthelminthic would remove that objection.

Dr. B. M. Wilson described the anti-hookworm campaign in Jamaica. There a sanitary unit dealing with village sanitation in general and latrines in particular took charge of the selected area, and after their work was well established the treatment unit began theirs. This plan was based on the fact that treatment was largely wasted unless reinfection could be prevented. Deaths after carbon tetrachloride had occurred in Jamaica, and there thymol was now the drug of choice—an effective one—against hookworms.

Dr. H. M. Hanschell recounted his experience of the success of D.C.F. in revealing very small ankylostome infections where other not more time- or labour-saving technique had failed to do so. In certain of his cases of secondary syphilis proving unexpectedly resistant to treatment discovery by D.C.F. and expulsion by thymol of the small number of hookworms present had been followed by rapid clinical and serological response to the same antisyphilitic treatment. Carbon tetrachloride was a proved potent liver poison. It should not, therefore, be given to a purged and fasting patient unless sufficient glucose were given at the same time. For the same reason, to protect the liver, glucose should be given with antimony drugs also.

Dr. J. B. Christopherson held that antimony acted directly on the schistosome, though possibly not as antimony tartrate, but perhaps in an organic combination. There was no evidence that action of the drug on body tissues produced an "antibody."

Dr. Manson-Bahr read a communication from Dr. F. G. Cawston, of Natal, reporting success in treating "creeping eruption" with intramuscular colloidal antimony, or intravenous tartar emetic injections, and also with carbon tetrachloride by mouth in human schistosomiasis and in distoma infestation of cattle.

Transmission of Kala-azar.

Dr. C. M. Wenyon began by pointing out that development of kala-azar and oriental sore parasites into *leptomonas* forms was strong evidence for an insect host. *Leptomonas* were essentially intestinal parasites of insects or other invertebrates. The flea had such an infection, which spread from flea to flea as small rounded bodies, resembling *leishmania* of kala-azar and oriental sore. They escaped in the flea's fæces, were ingested by flea larvæ, and appeared as *leptomonas* in the hind gut of adult flea. All insect *leptomonas* had that simple life-history. A sand fly which ingested parasites of kala-azar, or oriental sore, acquired *leptomonas* infection, but in stomach, œsophagus, and even buccal cavity, not in hind gut. If such sand fly fed through a membrane into a fluid it injected the *leptomonas*, it must therefore inject these also into wound it inflicted in skin. That no one had actually transmitted kala-azar, or oriental sore, by its bite was not due to lack of infectivity, for if the flagellates were removed by dissection from sand fly and injected into man's skin (oriental sore), or into hamster's peritoneum, a kala-azar infection occurred. Perhaps "receptive" condition was necessary to ensure infection from small dose injected through proboscis. *Leishmania* parasites would develop in the bed bug, but that could not be host for distribution of bug and disease differed, and if few *leishmania* were ingested by bug only few flagellates developed. In the natural host there was progressive increase of flagellates which attached themselves to cells of the intestine. No attachment occurred in bug. Association of canine with human kala-azar in Mediterranean region gave rise to theory of flea transmission, but careful experiments had failed to incriminate that insect. Kala-azar parasites in intestinal villi of man indicated possible escape in fæces, and they had been demonstrated in the urine. Contamination infection was unlikely for the parasites could not withstand drying and would not survive in water. Ankylostomes were possible ingestors of the parasites, but these helminths from cases of kala-azar had not revealed trace of infection. In the sand fly from small dose of *leishmania* there developed large numbers of flagellates attached to cells of stomach and persisting for life of fly; thus the parasite behaved as in a natural insect host. Probably site of infection, originally in hind gut, had changed; or perhaps sand fly was not original insect host. Man having become infected from original insect host, which might or might not now function, the sand fly might have become secondarily infected from man. A similar problem was presented by tsetse fly transmitted trypanosomes, where development in tsetse was also an anterior one. It was a posterior one in the primitive *Trypanosoma lewisi* in the flea. This spread from flea to rat by the latter's ingesting flea fæces containing infective trypanosomes. If the sand fly were the vector there were several possible modes of infection of man. Flagellates might be occasionally ejected from the fly's rectum on to the skin, but dose deposited would be even smaller than that injected from probocis. Crushing of sand fly gave larger dose which might be inoculable by scratching or by conveyance on fingers to mouth or conjunctiva.

In India the distribution of kala-azar corresponded with that of the sand fly *Phlebotomus argentipes*. In China the disease was found only north of the Yangtse. There was no information regarding existence of sand flies south of it. In India *argentipes* was most suspected, though development occurred also in *papatasii*. In North China *P. major* var. *chinensis* and *P. sergenti* var. became infected, but former was the better host. With oriental sore, *P. papatasii* in Palestine and Biskra had been infected, and in Bagdad *P. sergenti*. In Palestine and Biskra *P. papatasii* had been found infected in natives. In India a single infected *P. argentipes* had been captured in a kala-azar house. With South American cutaneous leishmaniasis a single experiment suggested that *P. intermedias* might be the vector. There were infections of animals—e.g., gecko and chameleon—and plants, with *leptomonas*, but nothing was known as to the relations these might have to the human diseases. At present, therefore, transmission problem of kala-azar and oriental sore centred around sand flies. The extraordinary flagellate development of *leishmania* parasites in them was convincing evidence that they were the vectors.

Discussion.

Prof. HINDLE gave an account of recent work supporting the view that sand flies were mainly responsible for the transmission of *leishmania*. He pointed out: (1) The *specific nature of the development in the sand fly*. The sand fly stomach did not serve merely as a favourable culture tube, for, if so, different strains of *leishmania* should develop equally well in any one species of phlebotomus. Yet, though four different strains of *leishmania* all developed into flagellate stage in the Chinese sand fly *P. major* var. *chinensis*, only the local strain of *leishmania* showed attachment of flagellates to stomach wall, and subsequent incursion of pharynx and buccal cavity. This presence of flagellates in anterior gut occurred only in the species of sand fly and with the particular strain of *leishmania* that seemed to be transmitted by it. (2) The *virulence of the flagellates in the sand fly*, proved by inoculation of contents of infected flies into susceptible hosts. As corollary, since these flagellates were present in the infected fly's proboscis and must therefore be inoculated into skin when that fly fed, that fly's bites would sooner or later produce infection. (3) The *geographical evidence*. In both India and China there was close agreement between distribution of kala-azar and that of sand fly presumably responsible for transmission of the disease. He criticised the transmission experiments up to date, and showed that with kala-azar they were inadequate in number to prove or disprove infectivity of the sand fly. In China kala-azar occurred in infants who, by reason of age, could not have been exposed to sand fly bites. Low and Cooke's case of kala-azar in an infant born in England, whose mother had contracted kala-azar in India, demonstrated that the disease might be congenitally acquired. The infant cases in China were doubtless of that kind. Referring to possibility of a second insect host in the cases of *leishmania* and *trypanosoma* in which flagellate stage occurred only in anterior gut of insect vector, here the parasite had merely lost hind gut flagellate stage in becoming closer adapted for life in the vertebrate host. Suppression of development in insect host reached its limit in the disease "dourine," where the trypanosome had become a parasite of the vertebrate host only, and transmission was only by direct contact in coitus.

Colonel A. G. MCKENDRICK quoted results of his statistical inquiry in support of the theory of sand fly transmission of kala-azar.

Sir FRANK CONNOR described his cases in Bagdad and in India of familial and of multiple oriental sore. His clinical observations of these and other cases, their personal habits and circumstances, favoured the theory of the frequent occurrence of direct contact transmission of oriental sore.

Dr. CHRISTOPHERSON pointed out the profound biological difference between the morphologically indistinguishable parasites of trivial oriental sore and fatal kala-azar. Parasites of oriental sore experimentally inoculated into human beings always produced only oriental sore. Clinical evidence suggested that oriental sore was the result of skin infection with insect flagellate, and kala-azar resulted after the flagellate had been further pathogenically modified by additional developmental cycle in another host. His own experience of naso-oral and dermal leishmaniasis in Sudan showed that lesions could be the result of inoculation by insect, and also by direct contact infection.

Dr. MANSON-BAHR said he had observed oriental sore appearing in one parent in India, and six months after the family of four had returned to England the sore appearing in the other parent and the two children before the lesion in the first parent had healed. This suggested direct contact infection. He pointed out that to Dr. Wenyon we owed valuable and indispensable pioneer work on the transmission of oriental sore.

Correspondence.

"Audi alteram partem."

ACUTE DISSEMINATED ENCEPHALOMYELITIS.

To the Editor of THE LANCET.

SIR,—Attention should be directed to the frequency with which cases of acute disseminated encephalomyelitis are being encountered in certain parts of London. A number of cases more or less similar have been met with during the last few years in association with vaccination or with measles, but otherwise, until recently, they have been rare. In June last, however, Drs. Hunter and Brain[1] were able to report that they had seen six cases within a period of two months. In Germany and Austria such cases have been recorded in moderate numbers during the last two years, and there they seem to have occurred in circumscribed epidemics. Redlich[2] in March, 1927, reported that he had seen numerous cases in Austria; Pette[3] saw 25 at Hamburg in 1926, and the early part of 1927, Muntzka[4] in a paper just published records five cases at Dölling.

Now that these cases are occurring more commonly in London it is desirable that their clinical features should be made widely known in order that as many as possible of the cases may be recognised. The more severe of the cases which I have seen are characterised clinically by the facts that the symptoms are referable to widely separated, or, at any rate, discrete parts of the central nervous system, and, secondly, that they come on in a series of attacks, different parts of the cerebro-spinal axis becoming involved suddenly at different times.

The first case I saw was that of a man of 70 who was under the care of Dr. C. E. Sundell at the Seamen's Hospital in January of this year. His illness began with pains in both legs, and within a day or two the legs became weak and numb; subsequent examination showed that this paralysis was of the flaccid type. During the next week there was considerable recovery and then paralysis of the

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[1] Hunter, D., and Brain, W. B.: THE LANCET, 1928, i., 1250.

[2] Redlich, E.: Wien. klin. Wochschr., 1927, xl., 344.

[3] Pette, H.: Münch. med. Wochshr., 1927, lxxiv., 1409.

[4] Muntzka, K.: Zeitschr. f. d. g. Neur. u. Psych., 1928, cxvi., 161.

hands came on abruptly in the course of a few hours; the extensor muscles in the forearms were as a whole more affected than the flexor, and in the right arm partial paralysis extended as high as the deltoid. Accompanying this paralysis was a sensory loss corresponding to the fifth and sixth cervical segments of the cord. These symptoms remained almost stationary for 14 days, and then acute bulbar symptoms came on and the patient died within a few hours from respiratory failure. In this case there was evidence of invasion at different times of three portions of the nervous system—lumbar enlargement, cervical enlargement, and medulla.

In the next case—a man of 32, admitted under the care of Dr. S. Wyard at the Bolingbroke Hospital on the last day of June—the patient had felt indefinitely ill for a few days and had severe headache; then he gradually lost the power of his legs in the course of four or five days, and the paralysis was accompanied by a feeling of numbness both in the legs and in the arms. During the next five or six days he was semi-conscious all the time. A fortnight after the beginning of the illness the left side of the face became paralysed, but it recovered rapidly after four days. In the limbs, at this stage, the tendon-jerks were all weak, the knee-jerks being unobtainable; the plantar reflexes were indefinitely extensor. The abdominal reflexes were absent. The patient complained for many days of severe pains in the arms. The cerebro-spinal fluid contained an excess of protein (0·10 per cent.) but no excess of cells. In the course of five or six weeks this patient made a complete recovery.

A third case was that of a man of 55, admitted under my care at the Bolingbroke Hospital on August 27th, 1928. He had not felt well for some months, and four days before admission on awakening in the morning he found that both his arms were weak and shaky. Within the next four days the hands became almost useless, and then recovered considerably. Two days after admission both hands had fair power, but they were still tremulous. By that time both sides of the face had become completely paralysed. The tendon-jerks were all brisk, and the plantar reflexes indefinite. There was no sensory loss. The patient was slightly delirious, but could be recalled to consciousness. He answered questions, but was very irritable. The cerebro-spinal fluid showed an excess of protein (0·085 per cent.). but no increase of cells. During the next 13 days his condition was almost stationary, but towards the end of that time his face showed great recovery. Then on Sept. 9th his temperature, which had hitherto been normal, rose to 100° F., and at the same time the patient began to have difficulty in swallowing and in talking. During the next 48 hours the temperature rose steadily to 102·4° F., and the paralysis of larynx and pharynx and tongue became absolute. The patient died from respiratory failure on Sept. 14th.

A fourth case was that of a little girl of 8 whom I saw at the National Hospital, Queen-square, on August 23rd. After a period of indefinite malaise she had suffered from pains in the lower limbs; then her legs became weak and she had difficulty in micturition, amounting almost to retention of urine. At that time she was considered to be suffering from poliomyelitis, but she had a high temperature. After three weeks the power of the legs had in great measure returned, but then the patient began to have difficulty in talking. (The precise nature of this difficulty cannot be determined.) She became very drowsy, and lay constantly with her head and eyes turned to the right. About the time of this aggravation her sight became dim. When admitted to the hospital she had extensor plantar responses on both sides, absent tendon-jerks in the right leg and arm, intention tremor in both hands, conjugate deviation of the eyes to the right, without any single ocular palsy, and partial atrophy of both optic discs. She is now recovering well, but it is too early to say how far recovery will go.

It is to be expected that in less severe cases of the same disease, the malady would not get beyond the stage of one more or less localised lesion, and most of the German cases have been of this type. Many of them presented the picture of a transverse myelitis of sudden onset and rapid recovery. Others at certain stages closely resembled poliomyelitis. In the last few weeks I have seen one case, similar to the foregoing as regards onset, but in which only spinal symptoms have appeared, and another case in which the diagnosis remains in doubt between this disease and poliomyelitis.

The prognosis generally seems to be more favourable than the record of these few cases implies. In Redlich's cases complete recovery was the rule and fatalities were few. In Pette's series of 25 cases most of the patients made good recoveries and there were only two deaths. Hunter and Brain reported four complete recoveries and one death among their six cases. Recovery may be incomplete and permanent defect remain, but no "after-effects" in the sense of disabilities developing after apparent recovery have, to my knowledge, been described.

I am, Sir, yours faithfully,

J. PURDON MARTIN.

Harley-street, W., Sept. 17th, 1928.

THE LATER RESULTS OF PARTIAL GASTRECTOMY FOR GASTRIC AND DUODENAL ULCER.

To the Editor of THE LANCET.

SIR,—Dr. Arthur Hurst's letter in THE LANCET of Sept. 1st cannot be allowed to pass without comment. He says: "Our experience shows that gastro-enterostomy is the commonest gastric disorder to-day, and undoing gastro-enterostomies is the operation we now most frequently recommend." This emphatic opinion from so eminent an authority might cause considerable confusion in the mind of the profession, if he had not spoilt the first part of this terse paragraph by figures cited immediately before it—viz., since 1921 there had been at the New Lodge Clinic 37 patients suffering from gastric ulcer, 165 from duodenal ulcer, and 67 from the ill-results of gastro-enterostomy or partial gastrectomy. So on his own showing gastro-enterostomy is not the commonest gastric disorder of to-day. Moreover, he does not indicate a very obvious point, which is that his clinic naturally collects failures.

Against Dr. Hurst's statement that the undoing of gastro-enterostomy is the operation he now most frequently recommends I put this one—of the hundreds of gastro-enterostomies I have done myself for duodenal ulcer and of the thousands I know which have been done by my colleagues, I cannot recall a single case in which the gastro-enterostomy has been subsequently undone, except where a jejunal ulcer has developed, and then, of course, it is the jejunal ulcer which is the disorder and not the gastro-enterostomy. But I suppose all of us have undone gastro-enterostomies performed where there was no sign of ulcer, past or present, and possibly Dr. Hurst has this class of case in mind when he makes the sweeping statement quoted above. In Leeds we have put this kind of surgery behind us long ago.

I am, Sir, yours faithfully,

Park-square, Leeds, Sept. 17th, 1928. E. R. FLINT.

To the Editor of THE LANCET.

SIR,—I find it a little difficult to reply, at one and the same time, to Dr. Hurst and Mr. Flint, for while the one ironically suggests that all operative procedures on the stomach are doomed to ultimate failure and that the commonest gastric operation of to-day is the undoing of gastro-enterostomies, the other tells us that the unsatisfactory results of gastro-enterostomy, far from reaching the 36 per cent. suggested in my article, are not more than 10 per cent., and that in many of these the symptoms are so slight that the cases could be considered satisfactory. Were I not very deeply impressed by the fact that in the present state of our knowledge of gastric and duodenal ulceration it is impossible to be categorical (even that surgical treatment is useless) I should find it impossible to reconcile these two opinions. Without reopening the whole question, however, there are certain explanatory points to which I should like to refer.

Both Dr. Hurst and Mr. Flint appear to be unfavourably impressed by the fact that I use the ability to take all kinds of food without restriction as one of my criteria of cure. But could any test be more appropriate, especially from the patient's point of view? If he has to continue upon a special restricted diet for the rest of his life he can scarcely regard himself as cured in the truest sense of that word, whether such a dietary be the sole treatment or merely the complementary treatment of a gastro-enterostomy. Unfortunately the cases of gastro-enterostomy included in my unsatisfactory group have had perforce to continue with such treatment for much longer periods than the three to six months which I claim should be sufficient if an operation is really curative. That a comparatively large ulcer will heal in such time if placed under the best conditions has been amply proved both by subsequent operations and radiographically. If operative or other treatment has brought about complete cure there should be no need for further dietetic restriction beyond this period, and it is in this respect particularly that the results of partial gastrectomy have turned out much more satisfactory than those of gastro-enterostomy, as indeed Mr. Flint's experience of the necessity for medical treatment "long afterwards" in the latter operation suggests.

It has been my ill-fortune, too, to meet several cases where following gastro-enterostomy for duodenal ulcer the patient remained completely free of digestive symptoms, but hæmorrhage or perforation many years later showed that the ulcer was still active, or, what is more probable, that fresh ulceration had occurred owing to the fact that the operation had not dealt satisfactorily with the cause, even although it had relieved the symptoms. This, indeed, is the crux of the argument—the relief of symptoms as opposed to the removal of the cause—and as far as the evidence of my cases goes it would appear that we are approaching the latter more closely by the performance of a partial gastrectomy than either by medical treatment or gastro-enterostomy. My attitude is, however, not a dogmatic one (the curtailment of the article to render it of suitable length for publication may perhaps have conveyed a wrong impression) and I realise to the full that the last word has not been said; yet the results in the cases of this series cannot be gainsaid, and in the absence of further knowledge they justify the recommendation of an operation which, in view of its mortality, any surgeon might otherwise hesitate to perform.

It would be interesting to learn what Dr. Hurst has to suggest, as an alternative, for those cases in acute agony who have already had a succession of medical treatments with almost immediate recurrence, and what prospects he has to offer them of returning to their former livelihood, often of an arduous nature, with little opportunity, either financial or otherwise, for carrying out any strict dietetic régime. The majority of the gastrectomy cases quoted in my article are men and women of the labouring classes who have returned to their former occupations without dietetic restrictions. But perhaps patients of this type do not find their way to the New Lodge Clinic. I am, Sir, yours faithfully,

NORMAN C. LAKE.

Welbeck-street, W., Sept. 17th, 1928.

BLEPHARITIS SUCCESSFULLY TREATED BY AN AUTOGENOUS ANTIVIRUS.

To the Editor of THE LANCET.

SIR,—It will be interesting to hear if Dr. Armstrong's case of blepharitis treated by bacteriological methods maintains freedom from relapse. During the last year every case of severe blepharitis seen by me in private practice, and in the out-patient departments of two London hospitals, has been found to be associated with gross focal sepsis. When the origin of the focal sepsis has been dealt with, usually either by the dental surgeon or the throat surgeon, combined with mild local treatment, the blepharitis has been permanently cured.

I am, Sir, yours faithfully,

A. F. MACCALLAN.

Welbeck-street, W., Sept. 15th, 1928.

INSOLATION IN PULMONARY TUBERCLE.

To the Editor of THE LANCET.

SIR,—I am glad to see attention called to the danger of rest in hot sunshine for those who are suffering from pulmonary tuberculosis. Verandas on the south side are commonly provided in sanatoria; but medical officers of experience know that it is unwise to use them in hot weather. All such structures should have ample gaps in the roof for ventilation or a discontinuous double roof. At Pinewood Sanatorium, Wokingham, a northerly veranda is provided as an alternative; in other institutions, rest shelters in shady situations. Even an open tiled terrace with awning next the building may be undesirably hot in summer. On the other hand, in dull or cold weather in this country we need all the sunlight available, so that permanent verandas in front of bedrooms have their drawbacks. At the Crooksbury Sanatorium awnings which can be furled are provided instead, and covered places not in front of the bedrooms; but in hot weather, for non-febrile patients, rest under the pine trees has often been preferred. To clear away all the trees from the vicinity of a sanatorium is a great mistake. Asphalted paths may be undesirably hot in summer for phthisical patients; dry walks, carpeted with pine-needles, are preferable. Sunshine treatment in "surgical" tuberculosis needs caution; in the pulmonary varieties it is dangerous to the febrile, and in some other cases.

I am, Sir, yours faithfully,

Farnham, Surrey, Sept. 14th, 1928. F. R. WALTERS.

BRITISH SOCIAL HYGIENE COUNCIL.

To the Editor of THE LANCET.

SIR,—Owing to the growing work of the British Social Hygiene Council it has been found necessary to obtain the services of a whole-time salaried medical secretary who is able to undertake medical educational work in connexion with the general organisation of the Council in all parts of the country. The medical secretary would also give assistance in the general work of the Council. As this entails a considerable amount of public speaking preference will be given to those accustomed to handling both medical and lay audiences. The post would give scope for anyone interested in research on venereal subjects and would probably be suitable for a younger man retired from one of the services. The work of the medical department is under the direction of the honorary medical secretaries and the medical advisory board. Further particulars are given in your advertisement columns.—We are, Sirs, yours faithfully,

KENNETH M. WALKER.
A. H. HARKNESS.
Hon. Medical Secretaries.

Carteret House, Carteret-street, London, S.W.
Sept. 15th, 1928.

B.M., B.Ch. Oxon. has omitted to enclose his card.

SUCCESS OF BIRMINGHAM CONTRIBUTORY SCHEME.—This scheme, which was started only eight months ago, already has 306,000 members and £61,000 has been paid to the hospital. *This result is mainly* due to the development of the Hospital Saturday Fund, which last year distributed £44,000. One of the conditions upon which the scheme was established was the abolition of notes and tickets.

TUBERCULOSIS DISPENSARY IN MANCHESTER.—The Ministry of Health has given notice that a public inquiry *into the proposal of the* Manchester Corporation to build a dispensary for the treatment of tuberculosis *upon* the vacant plot of land at the corner of Oxford-road and Denmark-road, opposite the Royal Infirmary, will be held in Manchester Town Hall on Oct. *11th.* During the debate in the city council the recommendations of the public health committee were approved, being opposed by only *one* member.

Obituary.

JOSEPH JOHN PERKINS, M.B. CAMB., F.R.C.P. LOND.

THE death on Sept. 13th of Dr. J. J. Perkins, at the age of 65 years, has come as a grievous blow to his large circle of friends. Affectionately known as "J. J." to most of his contemporaries, he was held in high esteem by his colleagues and former clerks, and was beloved by his patients, the secret of his genius for friendship being unselfish sympathy and generosity.

Born in 1863, Perkins started his career with a wide knowledge of the classics and of history acquired at Manchester University; it was not until he went up to Cambridge as an exhibitioner to Emmanuel College that his thoughts turned towards medicine. He became a scholar of his College and took a first-class in 1888 in the Natural Science Tripos before entering St. Thomas's Hospital at a slightly older age than the average medical student. Gifted with a retentive memory and with a keen incisive mind, he came early under the influence of the late Dr. J. S. Bristowe, who profoundly impressed him and for whom he entertained always the deepest admiration and esteem.

DR. PERKINS.

On qualifying in 1891 Perkins held house appointments at St. Thomas's and Brompton, taking every opportunity of increasing his experience, and in his long association with these two hospitals developing a clinical acumen and a deep knowledge of treatment which made his opinion much sought after, with the result that he acquired a very considerable consulting practice, not only in regard to diseases of the chest, his more immediate specialty, but also in regard to difficult cases in general. He would listen keenly to the history; then, after a quick but thorough examination, he not infrequently made a diagnosis in difficult cases surprising in its accuracy and brilliance. Although keenly impressed with the value of the older methods of physical examination he was quick to adopt new methods and applied them with a due sense of perspective. His ability, sympathy, and the practical helpfulness of his suggestions combined to secure for him the special professional distinction of being a doctor's doctor. He was for many years secretary of the National Council for the Prevention of Tuberculosis, devoting his time unstintingly to this work, so that his place will be hard to fill.

After an attack of rheumatic fever in early youth he was never robust, and in the later years of his life his health was far from good. In spite of this he worked extremely hard until a serious illness some ten years ago when he was away from work for many months. On returning, though he continued to practise, he restricted his private work, and about four years ago he decided to give up all professional activities. From this time onwards he devoted himself to his numerous interests, and was apparently happy in his keen enjoyment of them. He read deeply in the classics, took long motor drives to distant churches, where he indulged his love of architecture and increased his profound knowledge of monumental brasses and of old stained glass.

In congenial circumstances Perkins was a brilliant conversationalist and a witty companion with a keen sense of humour. His hearty appreciation of an apt reply or an amusing anecdote will long remain as a pleasant memory to his friends. But in spite of his large sympathies and of his wide circle of friends, there was even to those who knew him best a strange reticence, due to a sensitive nature and a modesty amounting almost to diffidence. It was this that prevented him from writing much in the medical journals and from producing books—a real loss to medicine, since he had garnered much medical wisdom which he was only able to impart to those coming immediately under his personal influence.

Of Perkins's genius for friendship we have received remarkable testimony of which only fragments can be quoted. The colleague who supplied the biographical notes writes: "I owe much to his stimulus, criticism, and wisdom, and find it hard to realise that the friend and counsellor of the whole of my medical life has departed. Perkins will be missed also, not least, by the young sons of his friends, to whom he was ever ready with sympathy, stimulus, and help." Another colleague says: "The beginning of my friendship with Perkins dates back to the time when I was a clinical clerk, and though as house physician he would of course possess what to the student seemed a profound knowledge of medicine, yet the main impression he left on me was not only that of a remarkably good house physician. Much more did he impress me even then with his kindly thoughtfulness and shrewd humour and above all with what I now realise was the early maturity of his outlook. The soul of loyalty to his hospital and a staunch colleague, his attachments were deep and enduring and he was never happier than when spending a week-end with some sanatorium friend. He was a good conversationalist, but in his long talks by the fireside, interesting, amusing, and stimulating as they were, he studiously avoided any reference to himself. Sociable he was and a delightful companion, but he viewed the world in a detached and impersonal fashion and held himself rather aloof from the rough and tumble of life. Good health he lacked, but as far as he could he hid this from the world and in his outward bearing he showed little evidence of the recurring outbreaks of tuberculosis which dogged his footsteps throughout life. The picture which I think Perkins will leave in the minds of most of us is that of a man of distinguished bearing, thin, fastidious in his dress, cheerful and often gay, mildly sardonic at times, but eminently courteous and considerate and always with a rather proud reserve concerning himself."

J. G. E. writes: "It was 32 years ago that I first met Perkins when I was house physician at the City of London Hospital, and to-day I mourn one of the best friends a man ever had. He was a man of many friends and he made us all realise the fullest meaning of that word, for with absolute obliteration of self he entered wholeheartedly into our lives and made our interests his own. He was always ready to encourage and help when we were in doubt, and many of us have reason to be profoundly thankful for his sound judgment and wise counsel."

ALBERT WILSON, M.D. EDIN.

DR. WILSON, who died at Fairwarp, near Uckfield, on Sept. 9th, was in his seventy-fifth year. He was born at Newcastle-on-Tyne, educated at the Friends' School, York, where he developed a marked taste for natural science, and went on to Edinburgh University, taking the gold medal in his M.D. for a thesis on heart diseases and, later on, visiting the Universities of Paris, Vienna, Berlin, and St. Petersburg. After qualifying in 1878 he was house surgeon at the Royal Infirmary, Edinburgh, and resident physician to the Cowgate Dispensary, playing a prominent part at the Royal Medical Society, of which he was president in 1879. Moving to London he had at first a City practice, but his interests tended more and more in the direction of the study of psychology, especially criminal psychology, and he became medical officer to the Walthamstow Branch of the Essex Asylum, doing much unostentatious work among poor folk in the East End. His varied publications included books on Education, Personality and Crime (1908), Unfinished Man (1910), and papers on multiple personality. At the time of his death he had just corrected the final proofs of a book entitled The Child of Circumstance, being a sociological study of the criminal couched in simple non-technical language and embodying the author's faith in the possibility of physical and mental improvement for the most degraded class of humanity. Dr. Wilson served with the French Red Cross in the early part of the war, and made a contribution on war wounds. All his life a keen traveller, his holidays were generally spent in some foreign clinic, where he added to his store of curious knowledge. Latterly he confined himself to consulting work. Dr. Wilson married, in 1881, Amy, daughter of Surg.-Capt. J. C. Minto, M.D., who survives him with two daughters.

Colonel Sir JOHN HEWAT, who died at Port Elizabeth on August 20th, took a prominent part in South African affairs in the intervals of a busy professional life spent in practice at Woodstock, a suburb of Cape Town. Born in Sarawak in 1863, he was a son of the late Captain John Hewat, of Cape Town, and was educated at George Watson's College, Edinburgh, and at the South African College, Cape Town. After graduating in medicine at Edinburgh University in 1887, he settled at Woodstock and became one of the leading practitioners there. He entered the old Cape House of Assembly as Progressive Member for Woodstock in 1904, and was re-elected in 1915 to sit in the Union Assembly. Under the leadership of the late Sir Starr Jameson he was for some years Chief Whip of the Unionist Party. Joining the Cape Garrison Artillery as a young man, he enjoyed long service as an officer of the corps, from which he retired with the rank of captain. At the Coronation of the present King he was one of the delegates chosen to represent South Africa and he was also one of a delegation from the Union which visited the war zone in 1915. He served in the brief German South-West campaign in 1915 as lieutenant-colonel in the South African Medical Corps, being mentioned in despatches, and was promoted to the rank of full colonel in 1917. He was knighted in 1919. A keen sportsman, Sir John was a steward of the South African Turf Club, and also president of the Cape Colony Athletic and Cycling Union.

Dr. F. J. NICHOLLS, who died at Eastbourne on Sept. 1st after a month's illness at the age of 58, was well known throughout the locality not only as a practitioner but as a sportsman. The son of Mr. E. W. Nicholls, of Eastbourne, he was sent to Rugby School, where he played in the XI. in 1888 and 1889. Thence he went up to St. John's College, Cambridge, and he studied medicine both there and at Guy's Hospital, qualifying as M.R.C.S. in 1899, and as M.B. in the following year. After special experience at the City of London Hospital for Diseases of the Chest, Victoria Park, and elsewhere, he settled in practice at Eltham, moving to Eastbourne some 19 years ago. During the war he did valuable work as anæsthetist to the war hospitals in the vicinity, and held a commission with the Sussex Volunteers. Outside his professional work he was an enthusiastic tennis player and golfer, and in former years played for the Eastbourne Cricket Club. His widow, the daughter of Mr. H. Simpson Gee, survives him with three sons and a daughter.

The death of Dr. OWEN PRITCHARD, at the age of 75, removes a distinguished member of the Welsh community in London. Educated at St. Bartholomew's Hospital he graduated as L.S.A. in 1880 and as M.D. in the University of Brussels three years later. Entering practice in London he became physician and later surgeon to St. Saviour's Hospital for Cancer and Diseases of Women, and made a number of contributions to professional journals. He was also associated with several other charitable institutions. In 1906 he was appointed High Sheriff for the county of Anglesey, and for the later years of his life was closely connected with the University of Bangor, which last year conferred upon him the degree of LL.D. in recognition of his services. Dr. Pritchard, who was unmarried, was a collector of books and china, and it is stated that some of his valuable furniture has been left to the National Museum of Wales. The funeral took place on Sept. 3rd.

Dr. WILLIAM MACFIE CAMPBELL, who died on Sept. 13th in his eightieth year, was a graduate of the University of Edinburgh, where he took the M.B. degree in 1869 and won the gold medal for his doctor's thesis in 1873. After post-graduate experience at Paris and Vienna, he went to Liverpool as house surgeon to the Northern Hospital, and it was not long before he was appointed to its consulting staff, as well as to that of other institutions in the neighbourhood, including the Liverpool South Dispensary. Interested especially in gynæcology, he published a considerable number of papers, chiefly in the *Liverpool Medico-Chirurgical Journal*, and won a high reputation among his colleagues, who elected him to various offices in the Liverpool Medical Institution, the most important centre of medical activity and interest in the city. Dr. John Hay, as president of this society, writes of him as follows: "I should like to put on record an appreciation of the valuable work done by him for the profession in Liverpool, and, more particularly, for the Medical Institution. In 1871 he became a member; from 1875 until 1901 he was continuously in office; and during 1898 and 1899 he was president of the Institution. But whether in office or out of office, he gave freely of his time and brains. He served the Medical Institution and the profession ungrudgingly, unselfishly, and wisely; and the vigorous health of our Society at the present time is in no small measure due to his sustained efforts. He has left us a noble tradition." Dr. Campbell had at one time probably the largest practice in the South End of Liverpool, and won the affectionate regard of his many patients. In his earlier days he was attached as surgeon to the 2nd Volunteer Battalion of the King's Liverpool Regiment, and in later life gave public service as a justice of the peace. His death will be regretted by a large circle in Liverpool.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—The following demonstrations of specimens in the Museum will be given at 5 P.M. in the theatre of the College in Lincoln's Inn-fields. The demonstrations are open to advanced students and medical practitioners. On Oct. 19th Sir Arthur Keith will discuss problems in human anatomy which arise out of the identification of a skull attributed to Lord Darnley, showing illustrative specimens. On Oct. 26th he will trace the development, and on Nov. 2nd the evolution, of the human foot in relation to orthopædic disorders. On Oct. 22nd and 26th and Nov. 5th Mr. T. W. P. Lawrence will comment on surgical specimens.

POST-GRADUATE COURSES IN FRANCE.—A series of courses on the diagnosis and treatment of cancer will be held at Strasbourg from Oct. 16th–31st, under the direction of Prof. Gunsett, to whom application may be made at the Centre Anticancéreux, Hôpital Civil, Strasbourg, Alsace. Dr. C. Laubry has arranged a course on diseases of the heart and circulation and of the blood, to be given at the Hôpital Broussais, 96 rue Didot, Paris XVI., from Oct. 8th to 20th. Particulars may be had from Dr. Moussoir at the hospital.

University College Hospital Medical School. The winter session of this school will open on Monday, Oct. 1st, when an introductory address will be given in the Library, at 4.30 P.M., by Sir Thomas Barlow, F.R.S.

Westminster Hospital Medical School.—The annual dinner of past and present students will take place in the Royal Adelaide Galleries, Gatti's Restaurant, Strand, on Monday, Oct. 1st, at 7 P.M. for 7.30, Sir James Purves-Stewart in the chair.

Chelsea Clinical Society.—The annual dinner will take place at the Hotel Rembrandt, Thurloe-place, London, S.W., on Oct. 23rd, at 7.30 P.M. Those intending to be present are requested to communicate with Mr. L. A. Harwood, 90, Sloane-street, London, S.W. 1, as early as possible.

Cancer Campaign in the North.—The campaign against cancer in Lancashire, Cheshire, and North Wales will now be resumed energetically, and the Council hopes that before the end of the year the sum of £200,000 will have been collected in this area, another £90,000 being required to this end.

St. Bartholomew's Hospital, Rochester.—The inadequate pathological department of this institution has been removed to an adapted water-tower, formerly part of a brewery, at the back of the buildings. St. Bartholomew's was the first general hospital in Kent to possess such a department. The staff deal with some 6000 cases per annum.

Extension of Rugby Hospital.—A new out-patient department and casualty wards are being erected at Rugby Hospital. Mrs. Arthur James, who recently laid the foundation-stone, has contributed £8000 towards the cost, as a memorial of her late husband. The penny-in-the-pound scheme in aid of this hospital, which was started only two years ago, has 11,400 contributors.

Blackpool Victoria Hospital.—The board of management have decided to build an entirely new hospital of 150 beds on a fresh site at a cost of about £100,000. The existing buildings are officially described as "absolutely out of date." The children's ward is a temporary wooden building, there are no separate medical and surgical wards, the nurses live away from the hospital, an annexe of 20 beds is separate from the other buildings, the administrative block is "totally inadequate," and the out-patient department is "unsatisfactory."

German Congress of Urology.—The eighth annual session of the Deutsche Gesellschaft für Urologie takes place at the Langenbeck-Virchow-Haus in Berlin from Wednesday, Sept. 26th, to Saturday, the 29th, under the presidency of Prof. Alex. v. Lichtenberg (Berlin). At the opening sitting on Wednesday Prof. C. Posner (Berlin) will deliver an oration on Max Nitze in memory of the jubilee of the invention of the cystoscope. On the same day Dr. Viktor Blum (Vienna) will open a discussion on hypertrophy of the prostate and diverticula of the bladder, and Dr. Rudolf Paschkis (Vienna) on chronic non-specific ulcers of the bladder. On Thursday will come up for discussion the pathology and treatment of malformations of the kidney and ureter, on Friday strictures of the urinary passages, and on Saturday the relations of urology to social legislation. There will be an exhibition of instruments, apparatus, and books during the Congress. Further information from Dr. Arthur Lewin, Berlin, W.50, Tauentzienstrasse 13.

Post-graduate Studies in Manchester.—Post-graduate work for the coming year in Manchester will follow the lines of previous years. Besides the teaching which leads to diplomas in special subjects, such as public health and psychological medicine, the University is undertaking set courses in special subjects. A whole-time intensive course in general medicine and surgery is at present in progress and will be followed by a short similar course in obstetrics and gynæcology, beginning on Sept. 29th. Part-time courses in ophthalmology will start in October, and in radiological work, diseases of the skin, and clinical pathology in the new year. Clinical assistantships are obtainable at several of the general and special hospitals. The hospitals also give courses in different parts of the year. The first part of the Royal Infirmary course lasts from Sept. 25th to Dec. 11th, and consists of individual lectures on independent subjects. The lectures are on Tuesday and Friday afternoons. On Oct. 23rd Sir Berkeley Moynihan will give the Lloyd Roberts lecture, his subject being Some Problems in Gastric Surgery. At Ancoats Hospital short courses will be given on Thursday afternoons on the sympathetic nervous system, minor operations on the ear, nose and throat, and on advances in antiseptics.

Dr. Kinnier Wilson has been made an honorary corresponding member of the Gesellschaft Deutscher Nervenärzte.

New Hospital at Bakewell.—On Sept. 11th the Duke of Devonshire opened a new infectious diseases hospital at Bakewell, Derbyshire, which will meet the needs of six urban districts and one rural district. The hospital cost £9500 and includes three blocks of buildings.

Dudley Guest Hospital.—This hospital is about to be enlarged from 104 to 185 beds. The existing buildings are, to a certain extent, to be modernised, and the additions will include two ward units of two storeys each and eight single-bed observation wards.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
  Monday, Sept. 24th to Saturday, Sept. 29th.—Royal Free Hospital, Gray's Inn-road, W.C. Course in Electro-Therapy by Dr. C. B. Heald. Four lecture-demonstrations on successive Wednesdays at 5.15 P.M. Westminster Hospital, S.W.—Special post-graduate Course in Medicine, Surgery and the Specialties. All day course.—Royal Eye Hospital, St. George's-circus, S.E.—Every afternoon. Course in Ophthalmology.
ROYAL NORTHERN HOSPITAL, Holloway-road, N.
  Tuesday, Sept. 25th.—3.15 P.M., Dr. E. H. Shaw: Demonstration of Immediate Microscopic Examination of Tumours.
CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.
  Monday, Sept. 24th.—1.30 P.M.: Hearing Tests.
  Wednesday.—1.30 P.M.: Examination of the Sinuses.
MANCHESTER ROYAL INFIRMARY.
  Tuesday, Sept. 25th.—4.15 P.M.: Mr. W. R. Douglas: Demonstration of Surgical Cases.
  Friday.—4.15 P.M.: Dr. P. B. Mumford: Some Problems in the Diagnosis and Treatment of Syphilis.

Appointments.

Barker, H. L., L.R.C.P. Lond., M.R.C.S., D.P.H., has been appointed Medical Officer of Health, Ilkeston.
Challans, F., M.D. Lond., Regional Medical Officer for the Ministry of Health in Devon, Cornwall, and Somerset.
Jones, E. H., M.D., C.M. Edin., Medical Officer of the Rhyl Medical Relief District of the St. Asaph Union.
Kennedy, A. D., M.D. Glasg., to be a Medical Referee under the Workmen's Compensation Act for Wick in the Sheriffdom of Caithness, Orkney, and Shetland.
Strachan, C. H., M.B., Ch.B. Aberd., Resident House Surgeon, *Batley Hospital.*
Certifying Surgeons under the Factory and Workshop Acts: Farrer, R. T., M.R.C.S. Eng., L.S.A. (Brighthouse, W. Riding); Mair, W. B. G., M.B., Ch.B. Glasg. (Carnwath); Roche, G. D., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg. (Scalloway, Shetland); and Waterhouse, A. R. (Wirksworth).

Vacancies.

For further information refer to the advertisement columns.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.S. Also Asst. H.P. Each at rate of £100.
Birmingham General Hospital.—Asst. S. £50.
Bridgetown, Barbados General Hospital, B.W.I.—Sen. Res. S. £300.
Brighton, Royal Alexandra Hospital for Sick Children.—H.P. £100.
British Medical Association, Tavistock-square, W.C.—Librarian. £400.
British Social Hygiene Council, Carteret House, Carteret-street, S.W.—Medical Secretary. £400.
Burnley, Victoria Hospital.—H.P. At rate of £125.
Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.
Carlisle, Cumberland Infirmary.—H.S. to Special Depts. At rate of £155.
Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120. Also Hon. Asst. Aural Surg.
Exeter, Royal Devon and Exeter Hospital.—H.P. At rate of £130.
Gloucestershire County Council.—M.O. for Maternity and Child Welfare. £750.
Gloucester, Gloucestershire Royal Infirmary, &c.—H.P. At rate of £150.

Greenwich Metropolitan Borough.—M.O. for Maternity and Child Welfare Work. £600.

Guildford, Royal Surrey County Hospital.—H.S. £150.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. Also H.P. Each at rate of £100. Also Part-Time Jun. Cas. O. At rate of £150.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, W.—Res. H.S. At rate of £75.

Huddersfield Royal Infirmary.—Pathologist. £750.

Infants Hospital, Vincent-square, Westminster.—Med. Reg. £120.

Jersey General Hospital and Poor-law Infirmary.—Res. M.O. £200.

Leeds, St. James' Hospital.—H.P. and S. £200.

Liverpool, Eye and Ear Infirmary, Myrtle-street.—H.S. £100. Also Hon. Asst. Surgeon to Ear, Nose and Throat Department.

Liverpool Sanatorium, Delamere Forest, Frodsham.—Asst. to Med. Supt. £250.

London Hospital, E.—First Asst. and Registrar to one of the five Surgical Firms. £300.

London Temperance Hospital, Hampstead-road, N.W.—Res. M.O. At rate of £175. Cas. O. At rate of £120. Also H.P. At rate of £100.

Macclesfield G [illegible] 180.

Macclesfield, [illegible] Clin. Asst. £75.

Maidstone, K [illegible] st. M.O. £300.

Manchester, [illegible] £600.

Mauritius, P [illegible]

Metropolitan Ear, Nose and Throat Hospital, 2, Fitzroy-square, W. Anæsthetist.

Middlesex Hospital, W., Feren's Institute of Oto-Laryngology.—Bernhard Baron Research Scholarship. £300.

National Hospital, Queen-square, W.C.—Asst. P.

Norwich, Norfolk and Norwich Hospital.—H.S. and Cas. O. Each £120.

Nuneaton Borough.—Asst. M.O.H. £600.

Prince of Wales's General Hospital, Tottenham, N.—H.S., Special H.S., and H.P. Each at rate of £120. Also Jun. H.S. and Jun. H.P. Each at rate of £90.

Public Dispensary, 122, Drury-lane, W.C.—Res. M.O. £120.

Queen's Hospital for Children, Hackney-road, E.—Physician-in-Charge Skin Department.

Royal [illegible] *Mall East.*—Milroy Lecturer.

Royal [illegible] *Circus, S.E.*—Clinical Assistants.

Royal [illegible] *-road, W.C.*—Cas. O. £150.

St. M [illegible] *&c., City-road, E.C.*—H.S. At ra[illegible]

Samaritan Free Hospital for Women, Marylebone-road, N.W.—Hon. S. to Out-patients.

Southampton, Borough Isolation Hospital.—Res. M.O. £360.

Southern Rhodesia Medical Service.—Govt. M.O. £500 to £600.

Swansea Hospital.—Two H.S.'s. £150.

Warrington, County Mental Hospital, Winwick.—Asst. M.O. £350.

Willesden General Hospital, Harlesden, N.W.—Res. H.S. At rate of £100.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Pangbourne (Berks.).

Births, Marriages, and Deaths.

BIRTHS.

Brooke.—On Sept. 13th, the wife of Ralph Brooke, M.B., F.R.C.S., of a daughter.

Cameron.—On Sept. 12th, in a nursing home, Belfast, the wife of Captain W. Moore Cameron, O.B.E., R.A.M.C., of a son.

Corner.—On Sept. 8th, in a nursing home, Bournemouth, the wife of Dr. H. W. Corner, of a daughter.

Gaussen.—On Sept. 7th, in a nursing home, Herne Bay, the wife of Surgeon Lieut.-Commander J. F. H. Gaussen, M.B., R.N., of a daughter.

Hardie.—On Sept. 11th, at King-street, Great Yarmouth, the wife of Ronald W. W. Hardie, M.B., Ch.B., of a daughter.

Liston.—On Sept. 15th, at Milner-street, Cadogan-square, S.W., the wife of Dr. R. Prosper Liston, of a son.

Porter.—On Sept. 13th, at Kidderminster, the wife of Dr. C. Petvin Porter, of a daughter.

MARRIAGES.

Lawrence—Batson.—On Sept. 7th, at Holy Trinity Church, Brompton, Robert Daniel Lawrence, M.D., to Doreen Nancy (Anne), only daughter of Mr. and Mrs. T. Batson, Overstrand-mansions, Battersea, S.W.

Murphy—Murphy.—On Sept. 1st, at Brompton Oratory, Major Denys Murphy, *M.C.*, F.R.C.S., I.M.S., to Vera, elder daughter of Mrs. Murphy, Greenleaze, Knowle, Bristol.

DEATHS.

Campbell.—On Sept. 13th, at his residence, Shrewsbury-road, Birkenhead, William Macfie Campbell, M.D., J.P., late of Liverpool, in his 80th year.

Edgelow.—On Sept. 14th, at Braddon Villa, Torquay, William Ford Edgelow, M.D., aged 75.

Forbes.—On Sept. 17th, at Cuminestown Turriff, Aberdeenshire, Hugh McGregor Forbes, L.R.C.S., L.R.C.P. Edin.

Perkins.—On Sept. 13th, Joseph John Perkins, M.A., M.B. Camb., F.R.C.P. Lond., aged 65.

Phillipps.—On Sept. 12th, suddenly at Seafield, Paignton, William Alfred Phillipps, M.D.

Wyndham.—On Sept. 7th, in London, Thomas Lancelot Wyndham, L.R.C.S. & P. Edin., aged 54.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE INFLUENCE OF INDUSTRIAL POISONS UPON THE DIFFERENT ORGANS.*

By Sir Thomas Oliver, M.D., F.R.C.P.

When a poison has been absorbed and has circulated in the blood, it might be expected that the whole body would more or less suffer simultaneously, but experience shows that certain organs and tissues exercise a selective influence upon some poisons and not upon others. A distinction must be made between acute and chronic forms of industrial poisoning. There is the opinion that those tissues of the body which are the last to be developed, and therefore the more delicately organised, are less resistant, hence the rapidity of the effects of alcohol upon the higher nerve centres in the brain. While the nervous system is not free from the harmful influences of lead, many research workers regard the blood and the hæmopoietic system as the anatomical elements earliest affected by lead, those bodily units, in fact, which are formed and function in the early stages of embryonic development, and which therefore ought to be the most stable. It is an interesting circumstance that while the blood and blood-making organs are readily influenced by lead, yet in the blood very little of the metal is found, even while the internal organs may contain it in considerable quantity. Although the blood may show physical and chemical changes due to the influence of lead, it has only slight retentive power upon the metal, possibly because the blood is ever changing and therefore rejuvenating itself, its corpuscles are short-lived, also that it is constantly eliminating the poison, while in the tissues generally, physico-chemical changes are less rapid, and there is therefore given greater opportunity for the metal to become more firmly linked to the cellular constituents.

The types of industrial poisoning which have the greatest interest for us are those where the amount of toxin received daily into the system is small, where elimination almost equals absorption, and where therefore poisoning is slowly induced. In many of these cases, symptoms of toxæmia may not arise for several years; so slowly, in fact, do the symptoms appear that the individual is not aware of his condition until some change occurs in his metabolism or he is attacked by some minor ailment.

Lead.

It is now several years since I remarked upon the storage of lead in a rather insoluble form in the body, also upon the absence of symptoms, until there have occurred chemical changes in the liquor sanguinis and the fluids bathing the tissues, whereby the deposited lead becomes soluble, thus favouring its reabsorption into the circulation. To this subject and the early harmful effects of lead upon the blood, Aub and his co-workers in Harvard University have given close attention, as also have Kehoe and Thamann, of the University of Cincinatti, and P. Schmidt, of Halle, who hold, like many other physicians, that, by a microscopical examination of the blood of lead-workers, plumbism may be detected before symptoms develop, and when, therefore, it is possible for further trouble to be averted. The relation of the blood to poisons passing through it are of a two-fold character; the blood may be little affected or physico-chemical changes are induced in it which affect its efficiency as an oxygenating and nutritive medium.

So far I have dealt mainly with lead, principally because, apart from iron and steel, lead is the metal which is most widely used in the industries, also because it has been the occasion of much ill-health among the workers. Most of its salts, too, have the power of precipitating proteins, as observed on mucous membranes, thereby exercising a protective influence compared with the corrosive effects produced by several other industrial poisons. Absorption of the metal is slow, so that time and opportunity are given for lengthened reaction to take place between the poison and the animal tissues.

Industrially, lead poisoning is seldom acute. When large doses of lead acetate have been swallowed by a healthy person, the symptoms which follow are less the result of absorption of the metal, than of the local effects of the lead compound upon the stomach and intestine. The intravenous injection of a neutral lead salt precipitates the proteins of the blood and may cause embolism. Harnack found in injecting lead-triethyl into the veins of animals that it became decomposed in the tissues and gave rise to symptoms of plumbism. Lead intravenously introduced into dogs causes paresis and paralysis, diarrhœa, colic, tremors, and convulsions. Harnack considered the diarrhœa to be the result of violent contraction of the intestinal wall, and that this persisted even when no peristaltic wave was passing. In my own experiments I found, after death, discontinuous portions of the small intestine, over lengths of 3 or 4 in., so firmly contracted as to have obliterated the intestinal canal, and which appeared to me to have been rather the cause and explanation of the colic.

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* Abridged from an address delivered to the Fifth International Congress for Industrial Accidents and Occupations in Budapest on Sept. 3rd, 1928.

In order to ascertain the effects of lead upon the heart and blood pressure, Sir Robert Bolam and myself carried out a series of experiments in which we introduced a solution of a lead salt directly into the blood stream. Our experiments showed that the result of injections of lead in animals was a general fall of the blood pressure.

There is a general opinion that workers in the lead industries in course of time develop structural changes in their arteries and have a high blood pressure. The numerous deaths among them from cerebral hæmorrhage lend weight to this supposition (but as the kidneys are prone to become diseased, inefficiency of these organs as a contributory cause cannot be ignored). We cannot quite place patients in whom symptoms of plumbism appear early in the same category with those who are the subjects of chronic plumbism, for in the latter structural changes have probably developed in the internal organs. One dose alone of lead hardly ever gives rise to symptoms, but if small quantities are repeatedly passed into the system through the alimentary canal or the lungs, chronic plumbism develops, indicating that absorption has taken place, and that possibly some of the lead may have become locked up in the tissues and from which it will be only slowly eliminated. The internal organs in which, after death, the metal is found are the liver, kidneys, brain, and bones. Lead is eliminated by the kidneys, the intestinal epithelium, the mammary secretion, and the saliva. Any effect, therefore, produced by lead is not so much due to the amount of the poison circulating in the blood at a particular time, nor to its deposition in the tissues, but, as Straub suggested, to the summation of the injuries inflicted by its recurrent presence in the blood in infinitesimal quantities.

Arsenic.

In Great Britain, since harmless pigments have replaced those containing arsenic in wall-papers and paints, industrial arsenical poisoning has considerably declined. In 1900 there were reported to the Home Office 22 cases of industrial poisoning due to arsenic, with three deaths; in 1926, five cases with three deaths; and in 1927, three cases with one death. Pure arsenic is insoluble in water, so that if swallowed it passes through the gastro-intestinal canal practically unchanged, although very minute portions might be converted into arsenious acid in the stomach and intestines. The symptoms caused by its compounds are less due to the metal itself than to the ions of arsenious acid, which if swallowed in fairly large doses cause violent abdominal pain, vomiting, and watery diarrhœa, muscular cramps, feeble pulse, coma, and death. It matters little the channel by which arsenic gains entrance into the body for the same gastro-intestinal events arise, showing that the mucous membrane of the alimentary tract is the medium whereby it is eliminated, although the metal may be found in the hair and also be a cause of pigmentation of the skin, as has been observed in chorea patients treated by increasing doses of liquor arsenicalis. Taken in medium doses over a varying length of time, it produces peripheral neuritis; an epidemic occurred in England a few years ago in beer-drinkers, the poison being traced to the glucose in beer which was obtained by sulphuric acid methods from iron pyrites containing arsenic. Yet, even to such a dangerous metal as arsenic, tolerance can be established by taking graduated quantities, as was shown a few years ago by the arsenic-eating peasantry of Styria and the Tyrol. These hill-men, swallowing arsenic in small but increasing doses, stated that it enabled them to climb the mountains with less effort, and that it improved their respiratory powers, while their women-folk believed that it improved their complexion. The practice did not appear to exercise any harmful influence, for these people lived to a great age without exhibiting any signs of ill-health.

The worst effects of arsenic as an industrial poison which I have seen have been not so much upon the internal organs as upon the skin. This was especially so upon the hands and fingers, also upon the external reproductive organs of men engaged in mixing colours, of which Scheele's green formed a large constituent. The skin of the fingers and hands was ulcerated, often down to the bone; the ulcers were angry-looking and painful.

The presence of arsenic in soot is regarded as the cause of chimney-sweep's cancer, also of malignant growths upon the hands of gardeners who use soot for potting and other purposes.

Arseniuretted hydrogen, when inhaled, rapidly induces sickness and vomiting, followed several hours afterwards by jaundice and hæmoglobinuria or hæmaturia. The breaking-down of the red blood corpuscles is so complete that the hæmoglobin becomes incapable of carrying on its respiratory function, while the liver and kidneys are severely taxed in regard to the elimination of the disintegrated products.

Mercury.

In the industries subacute and chronic forms of mercurial poisoning may be met with. Of the organs primarily affected in the less acute forms of poisoning the salivary glands call for mention. They are stimulated to great activity, the gums are swollen, the teeth loose, the breath fetid, and on the buccal mucous membrane small ulcers may be observed. The submaxillary glands become enlarged, mastication is difficult and painful, there are diarrhœa and loss of appetite, followed by pains in joints and limbs. To the psychical troubles, of which a sense of timidity and loss of self-control before strangers are noticeable features, the term *Erithismus mercurialis* has been applied. Voluntary muscular movement becomes inhibited. In addition to the inordinate flow of saliva, there are muscular tremors, at first mainly of the muscles of the face and hands, but if the individual continues to follow his occupation the tremors become general and render the individual helpless. In the company of Dr. Giglioli, of Turin, I had the opportunity a few years ago of visiting the mercury mines on Mont Amiata, and of witnessing some unusual signs and symptoms. Several of the men were so much affected through inhaling the fumes of the metal that, if during the act of walking, and this generally with a staggering gait, they were called upon suddenly to stop, they could not immediately arrest their progress. In attempting to do so they were either precipitated forwards or swayed excitedly forward and backwards. There might be no tremor observable when the body was at rest, but tremors became immediately apparent, equal in range to those observed in disseminated sclerosis, when slight effort was made. So violent may the movements subsequently become, or so extreme the muscular paresis or paralysis, that many of the affected smelters are ultimately rendered completely helpless; they can neither feed nor dress themselves. Workers in mercurial compounds not infrequently have albuminuria. With their swollen gums, fetid breath, and muscular tremors, the men present a broken-down appearance and have an unhealthy, sallow look.

Phosphorus.

As far back as 1870 the sufferings of lucifer match-makers had attracted public attention. In 1872 Finland, in 1874 Denmark, in 1897 France, in 1898 Switzerland, and in 1901 the Netherlands had prohibited the use of white phosphorus, but the regulations had not the desired effect, nor was any united and organised effort made to secure this object until Switzerland, in 1906, invited the various countries to attend a meeting in Berne, known as the Berne Convention, and at which the countries represented unanimously agreed to the prohibition of the dangerous metalloid. French chemists had found in sesquisulphide of phosphorus a safe substitute for the dangerous form, and wherever it has been used phosphorus necrosis has disappeared as an industrial disease. To France, therefore, belongs the credit of having made possible the replacement of a harmful by a harmless chemical agent in this important industry. It was not, however, until 1919 that India and Japan joined the Convention, but even as late as 1923 China had not done so. In 1925, according to the *China Journal of Science and Arts* of February and March of that year, there were 15,000 persons employed in lucifer match factories using white phosphorus. In January, 1925, China definitely prohibited the use of the harmful material, so that with her entrance into the Berne Convention there is now the probability of the disappearance of a painful occupational malady in the Far East.

Radio-active Substances and the Health of the Workers.

Three years ago my attention was drawn by Dr. F. L. Hoffman to the occurrence of necrosis of the jaw-bone and of aplastic anæmia in young women engaged in painting numerals on illuminated watch and clock dials. There had occurred six deaths and there had been reported seven cases of serious disease.[2] Radium salts formed the basis of the luminous material: one of the manufacturing firms used mesothorium. In painting the numerals on the dials the girls were in the habit of pointing with their lips the camel's hair brushes, and although each of the workers was given a bottle of distilled water in which to wash the brush before putting it between the lips, they disregarded the provision. The girls had followed the occupation for three years or more. Exposure to large amounts of radio-active material is followed by changes in the blood of the workers, microscopical examination revealing a reduction in the number of polymorphonuclear and lymphatic corpuscles. The leucopenia is pronounced. There is also a degree of anæmia suggesting a diminished output of red blood corpuscles from the bone-marrow. The colour-index, however, remains high. Many of the women in this occupation complained of headache, malaise, tiredness, and a sense of the need of more sleep, nervous irritability, and disordered menstruation, but the morbid condition which specially attracted attention was necrosis of the jaw-bone. For information of these cases we are indebted to a report furnished by Dr. Cecil K. Drinker, Dr. Martland, and others. The necrosis closely resembles the diseased bone found in phosphorus poisoning. An interesting point in regard to exposure to radio-active compounds is that the disease which develops may lie latent for a few years before showing its destructive effects upon the teeth and jaw-bone. From the outset these agents affect the blood and blood-making organs; in small doses they temporarily increase the numbers of red and white corpuscles of the blood, and this increase is followed, if the exposure continues, by a destruction of the white and by a diminished production of the red corpuscles, hence the consequent anæmia. In September, 1927, I examined in New Jersey five of these women dial painters; three of them could hardly walk or sit on a chair, except in a slanting position with limbs fully extended. Osteitis and strong adhesive fibrositis of the hip-joints prevented abduction of the limbs. In some of the women small areas of exposed portions of the lower jaw-bone could be seen and felt in the mouth.

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[2] Monthly Labour Review, U.S. Department of Labour, May, 1926. Pp. 20.

ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE Seventy-third Annual Exhibition of the work of this Society's members now being held at 35, Russell-square, London, W.C., shows vividly the degree of perfection which photography, both utilitarian and artistic, has attained. Colour photography has made great strides and many fine stereoscopic colour transparencies were on view; on the scientific side it is of great value in many fields. Several spectra of salts, glass and other substances photographed by polarised light illustrated the diacritical value of this method, which also serves to check the quality of artificial sunlight. One interesting use of monochrome photography is to test the efficiency and freedom from glare of motor-car headlights, and the general Motors Corporation exhibited an excellent series of photographs to show how this was done. Eastmans displayed their Panchromatic film and Wratten light filters, which immensely facilitate the reproduction of many coloured objects, such as paintings. Of especial medical interest was a fine series of X ray photographs by Kodak Ltd. and Ilford Ltd.; among others taken by Dr. J. H. Mather, one illustrated a gall-bladder after the oral administration of sodium tetraiodo-phenolphthalein. The life-history and minute structure of the green-house fly was depicted in five frames of microphotographs by Dr. G. H. Rodman. In addition to pictures many cameras and pieces of apparatus were on view. The exhibition remains open until Oct. 13th.

NEGLECT OF VACCINATION IN IRELAND.

FROM recent reports in the local press it would seem that, notwithstanding pressure from the authorities, there is still a good deal of opposition to vaccination in some areas in Ireland. At a recent meeting of the Fermoy (co. Cork) Urban District Council a letter was read from the Department of Local Government and Public Health stating that unless the Council took the necessary steps to make sure of compliance with the Vaccination Acts, the Minister would have no option but to institute proceedings to compel the Council to perform its legal duties. When the list of defaulting parents was read out, it was noticed that it contained the names of the chairman of the Council and of at least one other member. At Enniscorthy, co. Wexford, the urban council was directed by the Minister to institute legal proceedings against those who did not comply within a reasonable time after notices to carry out vaccination had been served on them. No action was taken, the chairman declaring that the serving of notices was as far as the Council could go.

PTERYGIUM IN MADEIRA.

THE origin of the peculiar encroachment of the conjunctiva on the cornea known as pterygium is still something of a mystery, some doubt having been thrown on Fuchs's plausible explanation that it is a further stage of pinguicula, but the circumstances under which it arises are fairly well known. Rare in England, it is common in dry climates with sandy soils, and among farmers, threshers, ranchmen, and others exposed to the elements. In the United States it is much more frequent in the south-western than in other areas; heat, dryness, wind, and exposure to sunlight and alkaline dust are there regarded as predisposing causes. Coming nearer home, the island of Madeira has been mentioned as a place where the condition is endemic; this is twice affirmed in the French encyclopædia of ophthalmology published under the auspices of Lagrange and Valude. Dr. Alfredo Rodrigues read a paper before the Third National Congress of Medicine, held at Lisbon recently, to controvert this statement. Pterygium, he admits, does occur in Madeira, where the hygienic conditions are neither better nor worse than in other marine resorts, but in his experience it amounts to less than 15 per cent. of all ocular affections met with on the island. This is much less than the frequency quoted by an English doctor, Heineken, a hundred years ago. The influence of high insolation may be present in Madeira, but the factors of high wind and dust are not. The town of Funchal itself is situated in a sheltered amphitheatre of mountains, and even the sun's rays are tempered by the nebulous atmosphere of the gulf stream.

SWORD-SWALLOWING.

AN advertisement in the personal columns of the *Times* of Sept. 12th for a sword-swallower "required to assist doctor in experiments" is a reminder that sword-swallowing has its dangers, although there may be few cases on record in which it has led to the death of the performer. Gross perforations of the œsophagus are, of course, uncommon, but considerable damage may be done by minor injuries. In 1885 Dr. Charles Gross reported the case of a man, aged 30, who conjured in public-houses as a recreation. Two days before admission the sword hurt him more than usually, and on withdrawing it he spat a little blood. His neck began to swell and swallowing became more difficult and painful, until he died suddenly three days after admission to hospital. Post mortem, there was no sign of any perforating wound, though a little excoriation was to be seen at the upper and posterior part, but the outermost coat of the œsophagus and the surrounding tissues were a diffused abscess extending from the back of the pharynx to the diaphragm. The news of this man's death induced two other sword-swallowers to consult Dr. Gross about the dangers of their curious profession. They were both in the habit of swallowing swords 21½ inches long, the blade tapering from 1¼ to 1 inch, straight, heavy, thick, smooth, with well rounded edges and point. They gave a demonstration which he described thus: "Straightening the passage by well elevating the chin, then putting the point of the sword well to the back of the throat, with one thrust they pushed it down as far as the hilt." Both of these experts acknowledged that they frequently hurt themselves, and one of them had been in St. Thomas's Hospital with an injury to the œsophagus, apparently a lesion of the mucous coat of the lower part.

PLASMOQUINE IN MALARIA: A CORRECTION.

IN Dr. Manson-Bahr's paper on the Therapeutic Action of Plasmoquine, published in our issue of Sept. 8th (p. 496), the statement is made, under the heading "For Benign Tertian and Quartan Malaria" that "treatment should extend over a further 44 days, composed of four separate weeks' treatment (making five weeks in all) of *12* tablets of plasmoquine compound daily with four days' interval between each week." In this sentence the figure 12, which we have italicised, should read 6.

UNEQUAL PUPILS.

M.R.C.S. writes: For years I have been in the habit of shaving in my bath, but have only recently taken to using a mirror. Since doing so I have noticed that my pupils, equal before I begin, become unequal during the act of shaving—the left much larger than the right. Within half an hour they return to equality. I am told I am physically sound and have no aneurysm. I have no explanation to offer, other than a very localised fear reflex due to performing a risky operation whilst on an insecure foundation. I should be interested to hear what other explanations occur to your readers.

MEDAL FOR A MEDICAL MAN.—Dr. J. H. Sheldon, of Wolverhampton, has been awarded a bronze medal by the French Government for courageous rescue work on the Aiguille du Petit Dru in the Alps.

A WOODEN HOSPITAL BURNED.—About one-half of Driffield Isolation Hospital, which consisted chiefly of wooden hutments of the army pattern, has been burned down. The fire was caused by a rubber mat hanging on a bathroom wall falling upon a lighted gas ring, and spread so rapidly that in five minutes all the wards were in flames. Of the 60 beds only 18 were occupied by patients, suffering from scarlet fever, typhoid, and diphtheria, and they were all safely removed to a new brick block which had just been completed. It will be remembered that it was only at the end of April last that two wards at the King Edward VII. Hospital at Windsor were burned.

Lettsomian Lectures
ON
RHEUMATIC HEART DISEASE IN CHILDHOOD.

Delivered before the Medical Society of London

By F. JOHN POYNTON, M.D., F.R.C.P. Lond.,
PHYSICIAN TO THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET; PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL.

LECTURE III.*

Delivered on March 7th, 1928.

The first general principle in the treatment of heart disease in the child is that rheumatic disease of the heart is only one manifestation of a general disease, and the problem is not a purely cardiac question. Success must turn on a general knowledge of acute rheumatism. The second is that as far as possible convalescent treatment should be linked up with well-known central hospitals whenever the private practitioner is not in a position to take their place. There will be a great loss of purpose if a heavy drift takes place towards isolated convalescent homes. The third is that, without interfering overmuch with the liberty of the subject, increasing organisation should give all cardiac cases after childhood careful supervision in the factory, the large business-house, or elsewhere. I hold that we possess no drug or other treatment which has a specific action upon rheumatic morbus cordis, though I do not expect general agreement with this view. Lastly, we must realise that our problem at the moment is very much more than the prevention of rheumatism and rheumatic heart disease, for it includes the amelioration of the latter. In the present state of our knowledge we have not failed when a child has developed organic disease of the heart, but we fail if we do not exert all our resources to secure for the child a full convalescence and do not make every effort to prevent further attacks and to indicate reasonable occupations for later life. The problem, in general, resembles that of tuberculosis, but there is more encouragement, because at puberty the incidence of heart disease in rheumatism tends to diminish. There must be further laboratory and clinical research, for we cannot cease from efforts to decide the exciting cause, from arriving at decisions upon the nature and frequency of predisposing causes, and from investigations into a more successful medicinal treatment.

Predisposing Causes.

There is much interesting work in progress upon the predisposing causes of acute rheumatism, and many differing views upon their relative importance. One point which I would emphasise is that acute rheumatism is particularly likely to follow when a spell of dry warm weather changes to cold winds and wet. It is not the dry weather, or the wet, upon which I lay the great stress; it is the sudden atmospheric change. Dry weather tends to dust formation and sore-throats in the large towns, and sudden cold and wet, in my experience, develop the rheumatic infection.

A good deal of attention has been directed to the infrequency of acute rheumatism in the well-to-do, but it is only a relative infrequency, for I have seen the disease occur severely in prosperous families. Again, it has been pointed out that it is not the poorest in the social scale who suffer, but those who are not actually necessitous. To explain this I fall back on my view that nervous tension is an important predisposing factor, and I believe that this is a salient feature in that particular class of life. These children often come from small families and have parents who feel the full stress of keeping a position above the fringe of careless poverty. The children are anxious to shine at school and at home, and do not possess the stolidity that many of the very poor show. I believe that damp, low-lying localities are harmful. I have never thought that damp localities or damp houses, or damp feet, are actual exciting causes, but they undermine the general health, and I am confident that the rheumatic child fares badly in such surroundings and that the rheumatism particularly tends to become intractable. I have seen too many examples to be disturbed by any statistics. I also believe that defective sanitation in a house is important as a predisposing cause.

The question of diet seems to me one which should be inquired into further in a large convalescent hospital. It has never attracted me as an important factor, and I have sometimes thought that it must be an echo from former days when gout was so much in the minds, and sometimes bodies, of our profession. Nevertheless a careful investigator, with an opportunity for prolonged inquiry, might well upset such a general impression and throw some light on this problem. For instance, Dr. Arbour Stephens has suggested that acute rheumatism is dependent upon a calcium deficiency. We certainly cannot allow any field to be unexplored in such a subject as acute rheumatism.

One statement that seems to me true, though I know it has been doubted, is that chorea is much more frequent in the elementary than in other schools. Chorea is a nervous manifestation of acute rheumatism frequently associated with heart disease, and we must strive to explain this frequency.

Our climate is in accord with the disease, for it is very variable and shows many manifestations, and its vagaries recur year in, year out. Local epidemics of acute rheumatism are very interesting and require further investigation. I have never been in the position to investigate the accurate details, but we shall now be on the watch for them and may learn some new facts. The disease is undoubtedly more frequent and more severe in some years than in others.

Methods of Invasion of Exciting Cause.

If we do not know the exciting cause, how can we detect its path of entry into the body? We do know that streptococci from inflamed tonsils will produce heart disease on experimental injection into the veins of animals, and that in children, particularly the very young, heart disease may sometimes follow a tonsillitis as dramatically as in an animal. I have also seen it follow immediately upon the old operation for guillotining tonsils and after enucleation.

Recently a girl was under my care in hospital for an attack of rheumatism with mitral endocarditis following tonsillitis, and the tonsils were obviously unhealthy. She made a good recovery. It is my rule to allow such cases to make a prolonged convalescence before operation, so three months later, after a change into the country, the tonsils were enucleated by a master hand. A fortnight later she was readmitted with severe pericarditis and eventually left hospital a cardiac invalid.

Another striking case came under my notice in June, 1926.

A school-girl, aged 13, who had suffered from a sore-throat and had enlarged tonsils and an attack of acute rheumatism with mitral disease, made a good recovery. Three weeks later the tonsils were enucleated, and three days after this the temperature rose and she rapidly developed a dangerous carditis with pericarditis which was almost fatal.

Incidentally, I think this case was a striking support of the streptococcal theory of the disease, for it began on the third day, which in our experimental experience was a frequent event with a virulent culture, and it reproduced precisely the events which happen when a rabbit is infected by injection. It is my belief that in such a case the child is directly inoculated with the micrococci through the raw surfaces caused by operation at a time when the susceptibility to infection is still high, for we must admit that, though a child may appear to have recovered from an attack of rheumatism, we are still ignorant of the completeness of recovery.

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* Lectures I. and II. appeared in The Lancet of Sept. 15th and 22nd respectively.

A rather remarkable case was that of an only child, with acute pericarditis and aortic and mitral endocarditis, a clear history of sore-throat, and large unhealthy tonsils. This boy had repeated attacks of fever and tonsillitis while in hospital, but he was so ill that I was afraid to advise operation, and repeatedly delayed. Eventually he was taken from the hospital by his parents.

It seems clear, from experiment, that the tonsils must destroy infection when they are healthy, but the difficulty is to ascertain when they cease to act as a protection and become a danger. The only solution that I can see will be from collective experience, based upon the observations of many careful investigators extending over a considerable period of time. So far, I think the balance is in favour of the opinion that the removal of unhealthy tonsils by enucleation tends to diminish the frequency and severity of further attacks, even if it does not prevent them. Dr. R. Miller is of the opinion that chorea, a minor evil, rather than heart disease, is the most frequent manifestation when rheumatism again attacks a child after removal of the tonsils. There must soon be at our disposal a great mass of evidence on the number of cases of acute rheumatism and heart disease that develop in children who have had no obvious signs of the disease before their tonsils were removed. When this is published it will give us a much more definite basis upon which to build our views upon this most important question. Because removal of the tonsils does not prevent further attacks when once a child has become infected, it does not follow that removal would not have prevented the original attack altogether. Once infection has taken place, we are not yet in a position to say when it has been destroyed in the tissues of the body or where it may be hiding. If a child has had an attack of rheumatism with evidence of tonsillitis, has apparently recovered and the tonsils seem healthy, and the tonsillar glands are not enlarged at all, or only to a slight degree, ought we to advise their removal as a precautionary measure or not? If so, should we operate at the end of the acute illness or wait until the child has made a thorough convalescence? There is considerable difference of opinion upon these questions, and it is for this reason that I am anxious for evidence upon the occurrence of first attacks of rheumatism in children who have already had the tonsils enucleated; if this be frequent it must influence our procedure and make us cautious. I endeavour to judge each case individually, but the judgment, however well intentioned, may very easily be faulty because of the intrinsic difficulties. I do not think there is any practical problem in the prophylactic treatment of rheumatic heart disease that requires more immediate attention than the correct line to take with the tonsils; routine operation requires complete justification.

I have not been impressed with the origin of acute rheumatism from dental disease in childhood, and am not convinced of the frequency of an alimentary infection. Many rheumatic children, it is true, suffer from abdominal pains, chiefly epigastric; some suffer from colitis and some from acetonæmia, t these may all be the results of the established ase and not evidence of primary foci. There is rly room for further investigation upon these questions.

Medicinal Treatment.

The medicinal treatment of rheumatic heart disease introduces another question upon which I think we, as a profession, ought to arrive at some definite conclusion. Much has been written upon the specific action of salicylates in acute rheumatism, but if by specificity is meant the action of a drug which, if used skilfully, produces the clear-cut results of a true antidote, like quinine in malaria, then I am convinced that salicylates are not specific. In recent years I have abandoned their use in the most severe forms of carditis in childhood. In some respects I have had an almost unique experience of this drug, because I was working at Great Ormond-street on cardiac dilatation when the late Dr. D. B. Lees was carrying out his well-known investigations on the use of large doses of salicylate of soda for acute rheumatism. It was then that I saw examples of its toxic action, which led to the introduction of the well-known formula combining it with double the dose of bicarbonate of soda. In the Encyclopædia of Medicine, published in Edinburgh in 1902, I pointed out the severe depression, dangerous vomiting, and fatal coma that might result from large doses of this drug in childhood, and my observations were corroborated by Prof. F. Langmead. I am now only concerned with rheumatic heart disease in the young. The value of the researches of Dr. Lees upon the use of this drug in adult rheumatic arthritis has met with ample proof, and its value for the arthritis and pains in childhood is unquestionable. For many years I used the drug for rheumatic heart disease in acute cases, in chronic cases, and as a prophylactic, but to-day I am not prepared to say that it exerts any specific action, but am of opinion that it is a *dangerous drug when given in large doses to fragile rheumatic children*. It introduces into the severe cases of carditis difficulties such as vomiting, depression, pulmonary œdema, and even coma. The temperature certainly may be lowered, but fever is very rarely any real danger, and the most virulent cases of rheumatic carditis may be practically afebrile. The only unexpected death I have had in the last five years from rheumatic heart disease was that of a little girl admitted for slight mitral endocarditis. The temperature was obstinate but not high, and my house physician, with the very best intentions, gave salicylate of soda grs. 20 every four hours—not a large dose to the enthusiast. I saw the child three days later for vomiting which, in spite of all efforts, proved fatal. So great a hold, however, has this treatment on the minds of our profession, that it is most difficult to break through its tradition. There is no alternative treatment with any claim to the term specific, and if salicylates are specific, they should logically be pushed in the severe cases.

The Ethyl-ester of Methyl-phenyl Cinchoninic Acid.

Fortunately, I have found a cinchonic acid preparation, an ethyl-ester of methyl-phenyl cinchoninic acid called "tolysin," which has some definite action in rheumatism and which is admittedly less toxic than the salicylates. I do not for a moment hold that it is specific, but it has enabled me to treat the worst cases of carditis without the anxiety of drug complications, and has satisfied the sceptic that I have at least been attempting to treat the disease. My great object has been to find a treatment which would not complicate the difficult problem of the management of severe carditis. Not only have we often to treat very nervous children, but in addition to the dangers of carditis there may be arthritis, pleurisy with or without effusion, massive collapse of the lungs, broncho-pneumonia, and chorea. In very rare cases acute œdema of the lungs, beginning, like "renal œdema," at the apices, may occur. This I have only seen in four cases, all of which had been treated with salicylates, but the number is too small to incriminate the drug wth certainty. It is a most dangerous complication. though not always fatal.

For success in the treatment of such a perilous condition as severe carditis I consider it imperative to diminish any tax on the resources of the child, and there are two clear lines of guidance. One is never to attempt paracentesis *pericardii* unless absolutely assured that the quantity of exudation is the real danger; the other is to explore the pleura first if doubt exists whether the distress is the result of a left pleural effusion or a pericardial effusion. If we push drugs like digitalis or salicylates, which produce vomiting, we imperil our success, for careful feeding and the taking of nourishment are essential. To explore unnecessarily is to add to the dangers, but to calm and obtain sleep with small doses of nepenthe, and possibly some bromide, is invaluable. Tolysin has seemed to me, in small doses (grs. 5-7 every four hours), to improve the general condition, and certainly has never done harm.

Oeller in 1911 showed that the action of phenylcinchoninic acid was akin to that of the salicylates, but, as it also produced similar toxic effects, the tasteless and less toxic ethyl-ester was introduced. In 1912 Bendix employed the ethyl-ester of methylphenyl cinchonic acid ("tolysin") for rheumatism, and Chace, Myers, and Killian, in 1921, obtained good results with it is America. Boots and Miller, of the Rockefeller Institute, made a further study of its use and dosage in 1924, as had Hanzlik, Scott, Weidenthal, and Fetterman, in 1923. They found it a safe drug, though not so potent as the salicylates. Most of the observations were made on acute rheumatism in adults, and doses from 7–15 g. were used in 24 hours. In 20 cases, in which very large and long-continued dosage was employed, the only toxic effects were buzzing in the ears, headache, vertigo, nausea, and vomiting, this last in three cases. All the evidence I could collect when I began to use the drug for severe carditis in childhood pointed to its slight toxic effects and definite action in rheumatism. For these reasons I selected this compound, but had the greatest difficulty in getting it, and more than once failed to obtain it at all, so I bring before you no exhaustive study.

Illustrative Examples.

The following are examples of patients not treated with salicylates, but with this drug. I have treated 11 cases of great severity.

Case 1.—Female, aged 10. Enucleation of tonsils had been done at 5 years. Fourteen days before her admission to hospital, vomiting and pains in the chest and abdomen developed. There were mitral disease, dilatation of the heart, pericarditis, and massive collapse of the left lower lobe. Streptococci were isolated from the blood by Dr. D. Nabarro and endocarditis produced experimentally with the culture by Prof. Wright at University College Hospital School. Excellent recovery. Salicylates were never used, but "tolysin" was given. Seen two years later, when at school, she was leading a normal life with stable heart and mitral systolic murmur.

Case 2.—Male, aged 8. Had rheumatic fever at 6 and 7 years; the heart was damaged as a result. Fourteen days' history of generalised pains. Admitted with acute dilatation, pericarditis, and left pleural effusion. Treated throughout with "tolysin." Good recovery after extreme illness.

Case 3.—Male, aged 4½. Admitted to hospital May 16th, 1927. Extremely anæmic, with numerous large nodules and profuse sweating. There was severe arthritis, causing some contraction of both knee-joints, great cardiac dilatation, general pericarditis and mitral endocarditis, massive collapse of the left lung, and chorea. The mental state was one of extreme nervousness, and later of actual disturbance of mentality. It is almost impossible to conceive a more severe case of virulent rheumatism in a child so young. Treated throughout with tolysin and most skilfully nursed, this child is now at the country branch at Tadworth. The nodules have mostly disappeared, and though he is still short of breath the pericarditis has cleared up. The heart extends one finger's breadth to the right of the sternum and one finger's breadth to the left of the left nipple line. There is a mitral systolic murmur at the apex. He is gaining weight and strength. It is my belief that this child would have certainly died if any attempt to push salicylate of soda as a specific remedy had been attempted.

Emergencies in Pericarditis.

Occasionally a large pericardial effusion does occur in a child under 12, and the fluid may push forward the intercostal spaces and give all the other classical signs. Ought we to aspirate, or, bearing in mind the fibrino-plastic character of the exudation, should we open and drain the pericardium? I have seen both methods used and each seems to me to have its place. If the exudation is very rapid and copious, the pressure great, and the patient very ill, it has been my experience that the exudation is more fluid than usual and that paracentesis will be sufficient to tide over the crisis. In other and more gradual cases, incision of the pericardium is preferable, as it enables the more fibrino-plastic exudate to escape. The operation which has seemed to me best is the abdominal route with removal of the xiphisternum.

I have seen this operation done in an earlier stage, when there is little exudation, with the idea of getting rid of a toxic fluid. My view of the pathology of the pericarditis as commencing in the subendothelial tissue does not make me optimistic about the results of this measure, and the operation, not in itself serious, is a formidable one for a child with carditis. The results have not impressed me, and in any case we should need to follow up such a step with some specific serum or vaccine.

Grave difficulties arise if, by mistaken diagnosis, a dilated heart with an adherent and thickened pericardium is explored, whether by paracentesis or incision. Only a surgeon who has had the misfortune to undertake such a case can realise how impossible it is to know where to stop. In one case the heart cavities were explored in three places and the child, curiously enough, improved greatly, but this is exceptional, and it is no light thing to puncture a cardiac wall much damaged by myocarditis.

I have never advised Braner's operation for stripping the pericardium in a rheumatic case, though good results have been reported. The first published operation of this kind in this country was done for me by Mr. Wilfrid Trotter, but the condition proved to be tuberculous. There was wonderful improvement, but death occurred four years later from tuberculous pleurisy. Another equally remarkable operation was done by Mr. George Waugh on a young man who was seen by Sir William Willcox and myself; this was a case of recently adherent pericardium due to a chronic septic infection. The result again was remarkably good, although the patient was apparently in extremis. The rheumatic children I have had under my care have been either too feeble or had too severe valvular disease to permit me to feel justified in risking operation.

Convalescent Stage.

It must be apparent that for the treatment of heart disease sufficient time must be given for the heart muscle to recover tone and for the nervous system to be strengthened by country air and quiet. Gentle education of the mind proves also a great assistance. We have a most treacherous disease to handle and delicate children to treat, and for these reasons no ordinary convalescent home can answer the purpose.

It is some 15 years since I brought forward reasons for special convalescence before the Association of School Medical Officers, and in "School Hygiene" for August, 1912, I ventured to write: "In years to come I believe medical supervision of school children, combined with the efforts of medical officers of health, both supported by the skill and care of general hospitals and assisted by special convalescent homes, will be the means of prevention of much chronic heart disease," and the pioneer efforts of the Invalid Children's Aid Association deserve a special mention.

To-day there is a general recognition of the need for special convalescent methods. Such a step means a considerable outlay of money, and those who provide this have the right to know whether there is a good return, in the relief of suffering and greater possibilities for a useful life in the future, where previously the State lost good citizens and the skill, care, and money spent on the illness in the city hospital were often frittered away. The real object of the special convalescent hospital is to give a child the necessary time to recover as thoroughly as possible from a carditis. I have never thought or suggested that it is a new method for the cure of rheumatism, but it is a means of correcting a serious fault in our therapeutics, a result of the necessity for keeping the beds in the parent hospitals free for acute cases. In addition, it is possible in such hospitals to add much to our knowledge of the life-history of rheumatism and rheumatic heart disease. It would, however, be dangerous to send severe acute carditis to such an institution. Children who are already hopelessly damaged by the scars of former rheumatic attacks, who have an adherent pericardium and grave valvular lesions and can only exist as complete invalids, are not going to be so much benefited by this treatment as to make their occupation of the beds economically sound.

I would, however, lay down no hard-and-fast lines upon these questions, for circumstances differ in various localities. Again, I would have no hard-and-fast time-limit for the stay of a child in hospital, but, choosing an enthusiastic and sagacious medical officer as the head of the institution and supporting him with a capable nursing staff, I would then leave it to him to decide the question.

Acute and passing dilatations of the heart will have time to recover from the immediate damage and also to regain tone. The slight mitral lesion and the early aortic and mitral lesions will have time to compensate thoroughly. A severe acute carditis will be given the prolonged rest and graded exercise which are indispensable. On the scientific side there is much to be learnt about the recovery of a damaged heart, not only from the study of the heart, but from a study of the child. We all recognise persistent fever in the rheumatic child, and at the back of our minds we suspect some activity in the cardiac lesions or some absorption of infection from a local focus. In these hospitals we shall eventually learn more about this question; we may find, for instance, a vaccine that will be helpful or that in some patients the fever is not an indication for continual rest. Light will be thrown upon the degree of recovery possible in heart disease. I do not mean the mere estimation of exercise tolerance, but the ability to lead a normal life. In these hospitals, if anywhere, we shall learn more of the history of mitral stenosis and of atmospheric influences. There is some difference of opinion on the question of the admission of chorea in the recovering phase. I think that these cases are most suitable when they can be accommodated, but we must be patient until doctors and nurses are convinced that chorea is a rheumatic and not solely a nervous complaint. In some of the hospitals, also, it is to be hoped that there will be opportunities for skilled cardiologists to carry out strictly scientific researches.

It is my hope, too, that one day in this great city there will be a centre for research and the coördination of research on the whole problem of rheumatism, a centre from which indications for lines of advance will be forthcoming and from which trained workers will be sent to the various clinical institutions where cardiac cases are congregated. The great prevalence of rheumatism would make such a step justifiable as soon as this country is able to recover from its financial stress. In no other way can we avoid a great waste of time and energy from scattered and incoördinate attempts at solving the many problems involved.

It will be advantageous if girls can be admitted for convalescence up to the age of 14, for then we may be able to learn more about the nervous disturbances that occur at that age, and their influence upon those difficult cases of myocardial weakness that sometimes result from acute rheumatism without valvular lesions. If disturbances of the thyroid and other endocrine organs take a part in the rheumatic infection or produce unusual disturbances in the rheumatic patient, it is in these institutions that their effects can best be studied. In particular, we need to know more certainly the real necessity, in disturbances of the cardiac action, for a progressive or more cautious line of treatment. These are some of the special advantages that I believe will accrue from this method of supervising the child who is convalescing from rheumatic heart disease.

There will naturally be difficulties. The choice of suitable cases must of course depend at first upon the accommodation available. While beds are scarce, we must use them for cases of early heart disease in which we have every hope of obtaining good and lasting results. This is not a simple problem, for a physician at a parent hospital may have under his care a child with active rheumatism and acute dilatation of the heart, which disappear as the case runs a favourable course. When the child is transferred it is not easy for the physician in the country annexe to realise that there has been any trouble at all. Yet this is the very case in which cautious progressive training of the heart is most important. It will therefore be very needful for the report from the private doctor or the parent hospital to set out clearly the facts of the active phase of the cardiac weakness. In all cases, indeed, the activity of the rheumatic attack before admission to the country annexe must be the chief point.

The certificates that have to be filled up for admission to such an institution need some thought. The questionaire can easily be made too long and tiresome, the certificate fail to get filled up, and the child lose its chance. The problem of the rheumatic child affords a splendid opportunity for the great sections of the medical profession, the general practitioner, the hospital physician, and the officials of the Ministry of Health, to draw closer to one another. The official can give way a little to the other branches of the profession and make his certificate as short and yet to the point as is consistent with safety, and in return the others can make it a duty to see to the signing of the certificate. The result will be that the sick child will have its chance.

I think we must be very careful in collecting evidence upon what are to be called hopeless and therefore unsuitable cases. Let me give two examples.

A little girl of 5 had a severe attack of general pericarditis with mitral disease, and was desperately ill, suffering from repeated attacks of anginal pains which threatened immediate death. Her condition seemed hopeless and her home surroundings were most unsuitable. As a last hope, and I admit with a very uneasy conscience, I obtained her admission to the Heart Home at Kurandai. My colleagues were extremely forbearing to me and kept the child—entirely against their own judgment, I felt—until she was foolishly removed by the parents when much improved. A year after the illness she came back to me with an obviously adherent pericardium and a heart which one could not expect to make a good recovery. The child was, however, marvellously better, had no anginal attacks, and was living a happy life under invalid conditions. If such a hopeless case can do as well as this—and it was for me a test case—I am sure we must be most careful, as accommodation increases, before we condemn any child's heart as incapable of useful recovery, still more of recovery sufficient to make a short existence bearable.

The other case, treated at home by good parents, had been under my care first with severe aortic and mitral disease, then later with what seemed must be a fatal pericarditis. This boy lived to be 21 years of age and did four years' steady work as a clerk without any breakdown until the dreadful and mysterious malignant type of endocarditis developed and proved rapidly fatal.

I cannot, however, pretend to believe that treatment in the best convalescent hospital will prevent children from having further attacks if they return to surroundings likely to produce them. As our knowledge increases, we shall learn to restore these children to the best health possible, and many will probably resist further infection. We shall not, however, succeed with them all until we know the whole history of causation; should this prove to depend upon some atmospheric conditions we cannot alter, control, or surroundings which we cannot alter, there must remain a certain percentage of relapses. Here comes in the great need for improvement in our medical treatment by medicine, vaccine, serum, or other methods yet to be discovered.

SOME RECORDS FROM KURANDAI.

I am very much indebted to my friend and colleague, Dr. B. E. Schlesinger, who is acting physician to the Heart Home of the I.C.A.A., at West Wickham, for an analysis of the results from the previous

Heart Home at Kurandai. This home was a pioneer effort in this country at open-air treatment, and was carried out under considerable difficulties.

Three hundred and ten children, varying in age from 3 to 14 years, were treated from 1924 to 1926. The duration of stay was from three to 12 months. All were rheumatic children; many had suffered from previous attacks. Three had severe relapses. One, with arthritis, tonsillitis, and pericarditis, was discharged improved; two, with tonsillitis, pneumonia, and pericarditis, died immediately after removal from Kurandai. There were two cases, both severe on admission, who had slight relapses with passing pericarditis. Eleven cases had some recurrence of arthritis, and all recovered. Five cases developed chorea, four of them having suffered from previous attacks. These relapses occurred most frequently in the winter months. Later histories were obtained in 153 cases, but the period of time between 1924, when the Home was opened, and December, 1927, when this analysis was made, is too short for the observations to be of outstanding value. Ninety-three were reported to be "well," 31 to be in "fair health," 3 to be "ill," and 10 to have died (including the two cases which have been already mentioned). Sixty-four were at an elementary school, 35 at physically defective schools, and 22 were at work.

The history of relapses after leaving the Home is not so satisfactory, but I would once more emphasise that the question of relapse in the home surroundings is another problem which requires special investigation.

Ninety-seven of the 153 had not relapsed, and 56 reported as follows: 10 relapsed with chorea, 13 with arthritis, 2 with "heart attacks," and in 31 the nature of the relapse was not definitely stated. It is interesting that 46 out of these 56 cases relapsed in the first year after leaving the Home. The cases admitted during these years varied widely: 122 had mitral regurgitation, 76 had mitral stenosis, 30 had disease of the aortic and mitral valves, 8 had aortic regurgitation, 37 were examples of simple dilatation, and 4 of recent pericarditis; 23 were cases of uncomplicated chorea, and 10 of uncomplicated arthritis.

I believe that children with rheumatic heart disease gain by convalescence in an open-air country institution where they can also receive education; if this is correct we are making a step forward in the treatment of heart disease in the early phase of its evolution.

Dr. A. P. Thomson has most kindly given me his latest analysis from the Baskerville Residential School at Birmingham of the first 100 children that passed through the institution. He traced 83, and some of these have been repeatedly examined over a period of four years from the time of leaving; 27, who had signs of permanent cardiac damage on admission to Baskerville, had either improved or held their own; 24, admitted with the diagnosis of carditis, were found later to have normal hearts; 12, who had no signs of carditis at Baskerville, had never developed them; 9 had deteriorated; and 11 had died.

Since these lectures were completed, Dr. Coombs has kindly sent me his latest impression of these results; he also supports my views on the promises of special convalescent treatment. Lastly, I should do a grave injustice if I did not refer with great admiration to the pioneer work of the American Heart Association.

LIMITATIONS OF COMPLETE REST.

It is difficult to decide the time for which a child should be kept at complete rest after an attack of rheumatic morbus cordis. Opinions differ because children differ, but my general impression is that the value of complete rest, so valuable in active heart disease, can be overestimated in convalescence. A child's heart gains very little—in fact, I think it loses—by prolonged, aimless rest in bed, and certainly the general tone of the child suffers. Graded exercise acts as a tonic to a child's heart. We have to judge when the stage for its employment is reached by observation of each individual case. We have to look to the general condition of the child. Is he gaining weight, cheerful, and fretting for movement? Has the pulse steadied, the impulse of the heart become firm, the area of cardiac dullness become constant? Has the temperature settled and the active signs of rheumatism disappeared? The heart of a child is not so frail that it will suddenly collapse, even if we do advance one stage a little prematurely, provided we keep a close watch. What happens is that the child becomes tired and pale, and the heart may be quickened when at rest and may possibly even dilate a little, or the temperature rise slightly in the evening. This set-back happens more rarely if we can start with skilful massage of the limbs. If a murmur becomes louder, the heart is probably reacting well. The young heart has remarkable vitality. In my cricketing days one of my friends, a double Blue, a County cricketer, and a brilliant fielder and hard-hitter, had, I discovered later, won all his successes in spite of a combined aortic and mitral lesion dating from acute rheumatism in childhood. I do not advocate this method of treatment, but if such a heart can stand the strain of first-class athletics and in the end only succumb to a malignant endocarditis at middle age, we cannot go far wrong in cautiously replacing complete rest with graded exercise for the many children who are kept moping and unnerved for months because they *have had a definite but mild carditis.*

For over 20 years I have made attempts to treat rheumatic heart disease by sera and vaccines. Messrs. Burroughs and Wellcome made the first serum for me when Dr. Vernon Shaw was working at the subject, and later I tried various antistreptococcal sera, but I never succeeded in obtaining results which justified any clear statement. My experience of vaccines in malignant endocarditis has been one uniform record of complete failure in both child and adult, used early or late, in combination with sera or separately, autogenous or stock, simple or complex, given by the expert or by myself. Not one case has recovered. If acute rheumatism be streptococcal, I consider that the vaccine I now use, prepared by Dr. D. Nabarro from eight strains of streptococci obtained from ante-mortem and post-mortem cases of rheumatic carditis, is rational. I am using it for subacute cases with persistent mild fever, and believe it to be worth a trial. The dosage is a safe one, and is as follows:—50 millions, 100, 250, 500, 750, 1000, 1500, 2000 millions, twice weekly at first, and once a week when the largest doses are reached. The vaccine is sensitised by Besredka's method.

THE BORDERLANDS OF FEEBLEMINDEDNESS.*

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IT is a characteristic of all social problems that they have no sharply defined frontiers. They are all so intimately related that we cannot view any one problem as an isolated entity, any more than we can picture any nation in a position of "splendid isolation." For instance, the problems of housing and rents cannot be considered without reference to the earning capacity and industrial efficiency of the workers who dwell in them. These questions in turn depend upon the character of the employment, the current rate of wage associated therewith and, above all, upon the mental equipment and physical fitness of the individual worker. But in no social problem is this interdependence more striking than in the great question of mental welfare. In England there has been too great a tendency to study it apart from its cognate problems. This tendency is the natural result of the historical development of our interests and of our attitude to the problem under changing social conditions, which until recently have centred attention too closely upon the educational aspects of feeblemindedness, forgetful of the fact that feeblemindedness is but one facet of the many-sided problem of youth and adolescence. On the Continent there has been less confusion of thought and, I think, a wider grasp of the issues involved, with the result that the subject of mental deficiency has been there regarded more from what one may term the eschatological point of view, by which I mean that which estimates the future character-development of each child and the possibilities of his *becoming* a satisfactory citizen, adjusted to the demands made upon him by the *community* in which he lives and capable of that ordered and regulated conduct and self-control which is the essence of citizenship. The child with a psychopathic inheritance, the neuropathic child, the neglected or ill-treated child, and the child who is the victim of mental conflicts which result from maladjustments at home, all form an integral part of this problem. It must ever be kept in mind that the outlook on life engendered by adverse circumstances such as these, and the defects in character which so frequently result therefrom, are at least as important as that reduction in general intellectual capacity which is labelled "feeble-mindedness." In attempting to widen our horizon, however, we meet the initial question: Are we to regard mental deficiency (from idiocy to intellectual retardation) as a unitary condition in which the effect follows a given cause, just as the congeries of symptoms which we call "enteric fever," follows infection by the specific Eberth's bacillus? Is it not more probable that under this general term we are grouping a number of conditions, ætiologically distinct, but manifested by the same general type of mental phenomena and conduct which are the direct outcome of mental processes? An analogy will perhaps explain my meaning. Until comparatively recent years all kinds of infections which were characterised by a continuous rise of temperature were grouped together under the term "continued fever," but with the increased knowledge of causation afforded by bacteriology these are now differentiated into distinct morbid conditions.

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* A paper read at the Conference of the Scottish Association for Mental Welfare at Edinburgh.

Two Categories of Mental Deficiency.

We can, I believe, distinguish two main divisions of mental defect; these may be termed "evolutive" and "devolutive." In the former the evolutionary processes have been retarded, and the individual, and usually also the stock from which he springs, has not reached that level of mental development which is demanded by our educational and social systems. In the latter group some intercurrent factors have come into play tending to the destruction of the stock in which they appear. To these factors, such as failure of, or lack of, balance between the activities of the ductless glands, I have applied the term "phthersigenic."[1] The types belonging to this devolutive category frequently show "stigmata of degeneration," whereas the evolutive types in no way differ in appearance from their normal fellows. In the evolutive group there is a reduction in the specific educational capacities, such as those for the acquisition of arithmetic, or of reading, rather than a reduction in the general intelligence. There is abundant proof that general intelligence is distributed in any community along a "normal curve of frequency" similar to the distribution of height, whereas these specific capacities show a markedly irregular distribution. This difference in the distribution of the two factors which go to form general intellectual capacity is a clear indication of the truth of the "Two Factor" theory of intellectual capacity formulated by De Sanctis and Spearman. In the evolutive group the specific capacities remain "larval," and though in this age of commerce and literary education the individuals who belong to it find themselves handicapped in the struggle to maintain themselves, yet they perform a necessary, though it may be humble, service to the community as "hewers of wood and drawers of water." In fact, the presence of such persons to do the drudgery and menial work in a complex civilisation is one of the safeguards of society as at present constituted.

If we take as our criterion capacity to conform to the standards and inhibitions of the community, the menace to society of individuals who show temperamental or character defects is far greater than that of the so-called feeble-minded. The original meaning of the word "character" was the impress of the die upon the plastic material of a seal or coin. It is of the greatest importance that we should keep in mind this twofold implication of the term—i.e., the innate plasticity or receptivity of the mental make-up and the forces and influences which are brought to bear upon it, by which it is shaped and moulded. Remembering this we realise how misleading is the antithesis "Nature *versus* Nurture," for the implied antagonism cannot exist, nor is it possible to calculate the relative values of each component. Heredity and environment form the warp and woof of the texture of personality.

Exogenous and Endogenous Factors.

The same facts can be expressed in another way. The material or bodily components of the mind of every individual share with the rest of the body the debts which each of us owes to the generations which have preceded us, the physical capabilities and weaknesses which are handed on from parents to offspring according to the so-called "laws of heredity." These are thus fundamentally biological factors and as they are inherent in us they may be termed endogenous. On the other hand, as Aristotle[2] points out again and again, man is by nature a social animal, and from the earliest days of his life suggestions of social import pour in upon him and with a pressure which increases year by year mould him to the pattern demanded by the community of which he is a member. Thus his conduct, which is the expression of his degree of adjustment to his social environment, is the impression of the design which has been cut upon the die. These factors are exogenous. "Character," therefore, implies a degree of permanence and stability of conduct, and the lack of these qualities constitutes in the main what is popularly termed a "weak character." But in the light of recent developments in psychology we are led to regard as the mainspring of conduct not the intellectual qualities of reason and judgment, but the emotions, and have come to associate the manifestations of the emotions with the activities of the endocrine glands. But since the regulation of bodily growth is also a function of these organs, a definite relationship has been established between the bodily and mental functioning. This is the explanation of the frequent presence of "stigmata of degeneration" in individuals belonging to the "devolutive" category.

Continental observers, for example, describe two distinct physical types as associated with markedly anti-social proclivities—i.e., the "Kobold type" amongst boys and the "Steatic type" amongst girls. The latter type is said to be found chiefly amongst prostitutes and women of the most degraded class. With a marked tendency to fatness, a coarse, greasy skin and thick tousled hair, is associated an incurable indolence and inability for any form of sustained work. The "Kobold," so called from his fancied resemblance to the gnomes or goblins of our fairy stories and myths, is a short, thick-set muscular individual with a large thick-boned skull balanced by a powerful jaw. (See figure.) Prof. Lazar, of the Psychological Clinic attached to the Children's Court in Vienna, told me in conversation that all of the five boy-murderers whom he had examined belonged to this type. The following is a good example of this Kobold type:—

CASE 1.—Boy, born April 4th, 1917, and first examined Oct. 18th, 1926.

Family History.—A bigamous marriage; father imprisoned and on release absconded to Australia. Mother a careful intelligent woman, anxious to do her maternal duties.

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[1] Æschylus: Septem contra Thebas, line 1054.
ὦ μεγάλαυχοι καὶ φθερσιγενεῖς
Κῆρες Ερινύες.

[2] Aristotle: Nicomach, Ethics 1, VII. 6, also Politics 1253 a2. See also Seneca, De Beneficiis, vii., i., 8.

School Report.—Was in Board of Guardians' Cottage Homes for several years. For past year has been stealing regularly and frequently, chiefly apples, bottles of sauce, sausages, jam, &c. Headmaster reports, "intelligent boy, above the average of his class." Untruthful and cruel but willing to help in the house-work.

On March 16th, 1928, he was charged with persistent wandering into railway trains. On March 1st he took a small sister at 10 P.M. to the station, where they secreted themselves in a train which he said was labelled "Crewe." On reaching Crewe they got out, seeing another labelled "Glasgow," got into it. Ultimately they found their way to Stockport. Three days later he took his sister by a local train for a 25-mile journey. On March 10th he again found his way to the station at 10 P.M. and, seeing a train to York, got into it, but was found at Burton-on-Trent. He gave the following account of his escapade :—

Child of the Kobold type.

"I played in the street after I had scrubbed the floors, until it got dark, and then went to the station. I got in a train; it was going to York. I wanted to go in a ship on the River Humber. I've seen (pictures of) people going on to the ship. I thought the ship would go down the Humber, round Scotland, and then past Ireland and over the 'Lantic Ocean' to Canada. New York is by North America. I thought I'd see some Red Indians and go with them in a tent; I'd work for them and scrub the floors. There's a lot of fruit. I'd live with the Indians because they're kind. The porter took me to a little office and they gave me some bread and cheese and put me in another train in the guard's van. I looked through the window and saw the fields and a fair and an aerodrome." (This is quite correct.)

He reads with ready facility and with the same tendency to fantasy building. Calculates quickly, and at once gave the correct change from half-a-crown after buying four loaves at 4½*d.* each. Physically he is short, thick-set, with large head and jaws, and no evidence of disease.

Physical and Mental Correlation.

Kretschmer [3] and others have noted that when a mental break-down occurs, the form of insanity which results is largely conditioned by the bodily configuration of the individual; that there is, in fact, a biological affinity between the bodily and the mental make-up. Bearing in mind this biological affinity and also the hereditary transmission of physical or endogenous characters, we are prepared for the discovery of a strong familial association of certain types of mental abnormality, including the various forms of insanity, mental deficiency and those neurasthenic manifestations which are grouped together under the inclusive term "neurotic temperament." This intimate relationship between types of bodily conformation and mental traits and dispositions is of course recognised in our experience of every-day life. Don Quixote, the lean and lanky idealist, is the opposite of Sancho Panza, the jovial exponent of animal spirits. In fact, amongst German writers the "Sancho typus" and the "Quixote typus" are used to designate opposite poles of combination of bodily and mental characteristics. From the social point of view these cases are much more important than pronounced cases of mental defect. From an administrative point of view they form a far more difficult and intricate problem, for they cannot be brought within the ambit either of the Lunacy or of the Mental Deficiency Acts. They belong to the borderlands of feeblemindedness. Yet even the most ardent of eugenists would scarcely at present propose that a mental break-down should entail segregation or sterilisation, and that marriage and parentage should be for ever prohibited. Yet such stocks may supply examples of every kind of anti-social behaviour. In the Minutes of Evidence presented to the Royal Commission on the Care and Control of the Feebleminded [4] is a genealogical tree which gives a vivid illustration of the burden which the community has to bear from stocks which carry this neurotic temperament. Here is another example :—

Some years ago, in the course of examining a boy of 11 who had been absent from school for two years with severe chorea, I was struck by the mental inertness of his mother. She was a highly neurotic, garrulous woman, who complained that "her nerves had affected her memory." She had received a better education than might have been expected from her social status. Two of her sisters had been insane. Two of her children had died in infancy; her other older son was normal but suffered from chronic ear-disease. Her two remaining daughters, aged 18 and 16, already showed marked mental instability. Her late husband, who was said to go "violent mad when drunk," had attacked her with a razor, and the question of his certification as a lunatic had been raised before his death from typhoid at the age of 48. He was the father of an illegitimate child. Of her husband's family one sister was insane before marriage, had had an illegitimate child, and was very violent-tempered. The first husband of this sister had been hanged for murder, and her second husband, whom she had attacked with an axe, had left her owing to her violence. Her daughter from her first husband had been certified insane. Another sister was a chronic alcoholic with one illegitimate child. A brother was described as "most violent," who "threw the crockery about." Another brother was described as "highly strung, most irritable."

This family history affords a good example of the various manifestations of mental instability and of the social havoc which degenerate stock may wreak in a community. It is indeed probable that the severe chorea in my patient was but part and parcel of the same genetic instability.

CASE 2.—A girl, aged 9, was examined on March 3rd, 1928.

Family History.—The father, who was discharged from the army as mentally unfit, states that while serving in North Russia "they reckoned I went mad in the firing line. I went properly mad. I jumped over the barbed wire and started firing, I don't remember much about it." He was placed in an asylum, and later had a second attack and was again in the asylum for four months. Is a quiet-mannered, debilitated man who earns his living by cutting firewood.

Present Condition.—A bright and engaging little girl who for the past two months has been a persistent thief from home and school, but her parents had noticed a tendency to pilfer for some time. She spends part of the money on herself and gives part of it away to other children. She shows a marked deftness and method in her pilfering, and no idea of remorse in robbing her father of the money he had saved to buy his wood. "I took 10*s.* from upstairs—mother was keeping it for my coat." "The teacher's bag was hanging on the pipes, I took 18*s.* I went with another girl to Woolworth's. We bought some sweets, a powder-puff and face cream, and some fancy garters. I've some long stockings at home. We went on the bus. We went to the coffee house and bought a boiled egg and bread-and-butter. We often go to the pictures. Dad gives us the money."

The girl showed no evidence of physical or mental defect except much fidgetiness, and was quite up to the average intelligence and education for her age.

CASE 3.—Boy, born on Sept. 27, 1910. Left school from Standard VII.

Headmaster's Report.—"Mental capacity fairly good, takes an interest in games; of fairly even temperament. Possesses considerable capability."

At the age of 10 he was sent to an Industrial School, having been charged with stealing £15 and a bicycle pump. While in the school his general conduct was good and no signs of mental abnormality were noticed. On being licensed out to a farm, in 1926, he set fire to the stacks of his employer. He states that he had been happy and well-treated at the farm. "I went to the pictures. I saw a ship on fire, and when I was coming across the field I was thinking of lighting a fire. When I came back I went to the farm and lit six or seven hayricks. I went to bed and got a drink of water. I was frightened because I knew I should get into trouble. I've never done it before. The idea came to me when I was coming across the fields and I felt I'd like to do it. I thought they'd blame someone else. I didn't want to damage the master. I weren't thinking when I was lighting it. I was sorry afterwards."

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[3] Kretschmer: Korperbau und Charakter, Berlin, 1921.

[4] Royal Commission, vol. i., pp. 611, 612.

Mental Examination.—Memory span of six figures. Understood the use and object of postage stamps. Calculated the change from 2*s.* 6*d.*, on buying four loaves at 4½d. each, quickly, and gave the number of halfpence in 7*s.* 6*d.* For three-word combination sentence gave "London's like a money (many) flowing river." Failed in detection of a fallacy, gave fair list of differences between wood and glass. Did Healy's Form Board B correctly. No physical disease.

Family History.—Mother has been in a lunatic asylum on three different occasions, is now at home, but is reported to be again in need of certification. Though the examination showed that he could not be certified under the Mental Deficiency Act, it is of course quite possible to argue that his actions are the preliminary signs of mental degeneration, though his subsequent history gives no indication at present of any such degeneration. He is now in regular employment.

It is clear from the family antecedents of these illustrative cases that when they reach adult life they are likely to constitute a menace to the well-being of the community unless the force of social suggestion acts with sufficient power to mould the character with the impress of social obligation. But the problem which presents the most acute difficulty is that of dealing with the numerous children who, as the result of an attack of encephalitis lethargica, show the strange perversions of character which manifest themselves in anti-social conduct. These children become addicted to persistent thieving, lying, and sex-delinquencies and are the bane of the home in which they live. Not a few of them find themselves in the Children's Courts, and some are convicted to industrial schools, reformatories, and prisons. Yet few show a deterioration of intellectual capacity sufficient to bring them within the Elementary Education (Defective and Epileptic Children) Acts or the Mental Deficiency Acts, and the majority remain free to pursue their own course of wayward and unruly conduct. The few who are to be seen in mental hospitals differ in no way from the rest of their fellow sufferers.

Austrian Methods.

But how is this impress of social obligation to be made if we narrow the scope of our efforts by the limitations imposed by the Mental Deficiency and Lunacy Acts? Herein I think we may learn much from the methods in Austria, where the problem is viewed from a wider standpoint without the departmentalisation which has grown up in England. There the basis of classification is in the main a psychological examination. There may be a tendency to rely too completely upon conformity to certain preconceived psychological types, but I think there is no doubt that such an examination and classification yields more valuable results, from the point of view of the capacity for future citizenship, than those which accrue from a determination of the mental age and intelligence quotient, useful as these may be. For example, at the Great Colony of Egginburg, some 50 miles from Vienna, there are about 900 male and female inmates of ages ranging from 6 to 25 who, on the results of a careful psychological examination, are housed in pavilions containing 25 beds under a supervisor. The inmates of the male section meet in common in the workshops, extensive gardens, farms and orchards and, where possible, boys from the country districts are employed in occupations which are likely to interest them and to be of value to them in after-life—e.g., gardening, farming, fruit-growing, carpentering—while the town-dwellers are taught the more mechanical trades which will serve them in good stead when they return to their homes in the towns—e.g., tailoring, weaving, shoemaking, baking, building, &c. This division, according to their individual interests, in itself tends to reduce mental conflict and to arouse an increased interest and contentment.

The groups into which the inmates are divided are: (1) Those suffering from simple neglect without character defects. (2) Those who have suffered from neglect or ill-treatment and exhibit true character defects and conflicts at home, showing a tendency to gang-formation. (3) Those who show slight neuropathic tendencies. (4) Those who show severe neuropathic conditions, but with good intelligence—the "difficult child" type. (5) Those who suffer from psychopathic defects, but without instability of character; mental conflicts. (6) The aggressive or Apache type, often with reduced general intelligence. (7) Those with severe psychopathic defects, epilepsy, early dementia præcox cases. (8) The feeble-minded.

It is only when one sees a mass parade of all the inmates divided into groups that one realises the practical validity of this method of classification.

A very similar classification system is carried out at other institutions which I have visited in Vienna, as for example at the Schutzheim for difficult boys managed by Dr. Kehrein under the auspices of the *Sodalitas Salesiana.*

It must not, however, be inferred that no psychological classification is used in England, but the point upon which I wish to lay emphasis is that here each group would be treated, if at all, in a separate institution and generally under separate authorities, both central and local—e.g., the local Education Authority under the Board of Education; the Poor Law Guardians under the Ministry of Health; Industrial and Reformitory Schools under the Home Office; the Mental Deficiency Committee under the Board of Control; and voluntary organisations. Yet each group represents one aspect of the great protean problem of childhood and adolescence and most of them belong to the borderlands of feeblemindedness, each being symptomatic of a difficulty in adjustment to the environment and the realities of life. We cannot too often remind ourselves of the saying of the Roman philosopher, Seneca,[5] *non scholæ sed vitæ discimus,* for the purpose of our educational efforts is not the mere inculcation of knowledge, but to aid each individual to play his part, however humble that part may be, in the community of which he is a member; to give, in fact, in the words of Plato,[6] "that education in virtue from youth upwards, which makes a man eagerly pursue the ideal perfection of citizenship and teaches him how rightly to rule and how to obey."

Upon the standpoint from which we survey the problem will depend not only the scope of our endeavours but the means which we shall employ. The wider our view the better able shall we be to envisage the problem of mental maladjustments as a whole, unfettered by any artificial sub-division of the individuals whom we hope to benefit by our efforts, and the greater will be the advantage to the community which we serve.

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[5] Seneca: Epist. 106, §12. [6] Plato: Laws, i., 643.

LOTTERIES FOR BOMBAY HOSPITALS.—It was recently proposed to the Corporation of Bombay that money for the maintenance of the local hospitals should be raised by means of lotteries. The plea was supported by the argument that the public of Bombay are already supporting hospitals and charitable institutions in Goa through the Goa lotteries, of which there is one every fortnight, and it was calculated that from 20 to 25 lakhs of rupees could be raised in this way. The Medical Relief Committee of the Corporation referred the matter to the Municipal Commissioner, who pointed out that such lotteries would require the sanction of the Presidency Government, which was very unlikely to be given to an organised series. The proposal has therefore not been entertained.

BLOOD TRANSFUSION IN BLACKWATER FEVER.

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THERE is no disease in which the prognosis is so uncertain as blackwater fever, whether treated in the tropics or in England. From time to time practitioners get a series of favourable cases and are then apt to conclude that the success is due, say, to the administration of some special drug. A subsequent unfavourable series, however, causes them to doubt, and warns them not to boast about their previous results. An experience of 28 years, both abroad and at home, leads me to the conclusion that, apart from careful nursing and attention, there is no specific treatment for this disease. Many drugs have been lauded from time to time, only to fall into disfavour and disuse.

The main causes of death in blackwater fever are (1) syncope, (2) acute hæmolysis, (3) suppression of urine, (4) hyperpyrexia, and (5) asthenia, which produces, perhaps, the most disappointing results. In this type of case the urine clears, yet the patient does not improve, the blood does not regenerate, and gradually a semi-comatose condition supervenes and death takes place. Looking back, one is impressed by our powerlessness to prevent death in such cases. The marrow seems to become exhausted, and no longer capable of producing new blood.

In a recent case of this kind we tried to save life by blood transfusion, and so had the opportunity of seeing its effect in stimulating the marrow to renewed life and the formation of fresh blood corpuscles. We had no hesitation about trying this, even considering the possibility of causing more hæmolysis, because the patient could not have lived through the night.

In a paper on blackwater fever in London,[1] Manson-Bahr and Sayers record a somewhat similar case. They say:—

> "In a recent moribund case in whom the urine had cleared, but who was suffering from extreme anæmia (the blood count showing only 850,000 red cells per c.mm.), blood transfusion of 700 c.cm. of blood was performed, with the result that the patient revived in a miraculous manner and regained consciousness. There was no evidence of any further hæmolysis, and the urine remained clear. Unfortunately the improvement was not maintained and, in spite of a further transfusion, the patient died three days later."

In this case the authors considered the results encouraging and thought it was worthy of another trial if a suitable case occurred.

The Present Case Described.

The history of our case is as follows:—

European, male, aged 50, a planter in British Guiana. Born in England; went to British Guiana about 1896 and has lived there ever since with the exception of holidays in England, the last of which was four years ago.

Previous Illnesses.—Measles; no scarlatina, enteric, or rheumatic fever. Many attacks of malaria during the last 25 years; one attack of dysentery. Had an attack of (?) hæmaturia five years ago (1923), and was in hospital six weeks. No definite diagnosis was made. Came to England after this attack and saw a specialist, who could find no cause for the hæmaturia. X ray examinations were negative.

Present Illness.—In January, 1928, the patient suffered from a series of short attacks (about four in number) of what was called hæmaturia. He did not go to bed, but went on with his work the whole time. The attacks lasted three or four days to a week, with three to ten days' intervals. Patient then sailed for England and at first felt fit and well, but a little later he felt feverish once or twice. On Friday morning, March 23rd, he got a chill while on deck and developed a sharp fever. He passed dark-coloured urine that afternoon, and his temperature was 103° F. that night. The ship arrived at Tilbury on March 26th, 1928, and the patient was immediately brought up to the Hospital for Tropical Diseases and admitted at 1 P.M. A cursory examination at once showed that he was suffering from hæmoglobinuria (blackwater) and not hæmaturia. He was desperately ill, deeply jaundiced, anæmic, with a large spleen and a subnormal temperature, 96·6° F. The pulse was fair. The lungs showed considerable bronchitis, with râles and rhonchi over both bases. A blood count showed the number of red blood corpuscles to be as low as 980,000 per c.mm.; white blood cells, 7000; hæmoglobin, 30 per cent.; differential count: polymorphonuclear leucocytes, 67 per cent.; large mononuclear leucocytes, 7 per cent.; lymphocytes, 26 per cent.; eosinophils, 0. No parasites. Anisocytosis and poikilocytosis marked. Urine: dark reddish black colour; albumin, + +; many granular casts and debris; no red blood corpuscles; hæmoglobin present.

Treatment was at once commenced with rest, warmth, fluids, nourishment, and alkalies. The foot of the bed was raised; milk diluted with soda water, orange water with glucose, barley-water, and sodium bicarbonate in water were given repeatedly in small amounts by the mouth.

At 11 P.M. on the night of admission, considering the journey from the dock to the hospital, the patient's condition was fair. Since admission at 1 P.M. over 20 oz. of black urine had been passed, which showed evidence of clearing in the later samples. Fluids were being taken well; the pulse was 112, and its volume fair.

At 6.30 A.M. next morning the patient showed signs of collapse. The pulse became almost imperceptible at the wrist, and the breathing irregular and of the Cheyne-Stokes type. The mouth and tongue were very dry and sore. Strychnine gr. 1/30 subcutaneously was followed by intravenous glucose ℥ viii. at 8 A.M. By 10 A.M. a rapid change for the worse set in, with sweating, pain in the chest, rapid and feeble pulse, and respiration-rate 42. The features became pinched, the eyes dull, and a mucus rattle appeared with respiration, the patient being too weak to cough. Strychnine gr. 1/30 was again given, followed by camphor in oil 1 c.cm. an hour later. Some delay (through no fault of the London Blood Transfusion Service, who in this case, as in all previous cases, have never failed to provide volunteer donors to this hospital at short notice) arose in arranging for a blood donor, and during the interval before his arrival the temporary improvement, which had again followed the stimulants given at 3 P.M., passed off. By 6 P.M. signs of rapid dissolution were present: a semi-conscious state, glazing of the eyes, rattle in the throat, and very feeble pulse. We were unanimous that without blood transfusion death was imminent.

The patient's blood had previously been examined and found as follows: red cells, 980,000 per c.mm.; hæmoglobin, 30 per cent.; white cells, 7000; blood-group III.; van den Bergh: direct test negative; indirect test strongly positive—about 22 units. Test for hæmolytic system, as found in cases of paroxysmal hæmoglobinuria, negative. At 7 P.M., after checking the absence of agglutination of the donor's cells by the patient's serum, blood transfusion was started and 400 c.cm. of citrated whole blood was given. During the transfusion a visible improvement took place; the pulse became stronger, the colour less ashy, the tongue less dry, and at the close of the transfusion the patient succeeded in coughing up mucus from his throat. The urine subsequently passed showed no evidence of any further hæmolysis; 44 oz. of black water had been passed in the first 16 hours in hospital, and contained much albumin and some granular casts. Red blood cells were not seen, but hæmoglobin was present. At 10.45 P.M. strychnine was again used to treat a sudden collapse; the very brief improvement was followed at 11.20 P.M. by another period of collapse. Shortly afterwards the bowels moved in response to an oil enema; there was a very distinct improvement, the pulse being better and stronger. As the bowels had been confined for some time and, as was discovered later, hæmorrhoids caused much pain on defæcation, it is probable that the collapse was associated with the bowel movement.

March 28th: The patient had slept for short periods during the night. He maintained the improvement during the day, but had slight incontinence of fæces and urine with pain on micturition. His general condition remained much the same until the afternoon of the 29th, when he became distressed and appeared to have considerable pain over the [illegible] f the right chest, where pleuritic friction was audible.

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[1] P. Manson-Bahr and E. G. Sayers: THE LANCET, 1927, i., 273.

The application of antiphlogistine gave relief and the condition appeared to resolve. The urine collected for the two periods of 24 hours was 61 oz. and 47 oz. The blood count showed 1,000,000 red cells and hæmoglobin 30 per cent.

30th: In the morning the breathing became laboured, the pulse quickened, and the patient appeared more drowsy and weaker. He was coughing up large quantities of sputum. As he was obviously sinking, it was decided to transfuse blood again, and at noon 300 c.cm. of citrated whole blood were given. There was an immediate general improvement, which was maintained throughout the afternoon and evening.

31st: Patient had slept a little during the night, in spite of a distressing cough, and was stronger and mentally brighter by the morning. A blood film showed normoblasts for the first time. A blood count on April 1st showed 1,630,000 red cells and still no parasites, and another, next day, showed 2,200,000 red cells.

From April 1st onwards the history was one of slow but steady progress. The amount of urine passed daily varied from 60 to 80 oz., the temperature, which had been swinging between 99·5° F. to 101° F., began to subside, and the cough became less troublesome. Liquor arsenicalis ♏i. t.d.s. was started on April 2nd, and was gradually increased. On the 9th "ring" forms of the parasite of subtertian malaria (*Plasmodium falciparum*) were found for the first time. Quinine hydrochloride gr. i. with iron and arsenic was therefore given three times. On April 10th, tablet plasmochin co., one twice a day, was started, and the iron and arsenic were discontinued. The plasmochin tablets were gradually increased.

Date.	R.B.C. in millions.	Per cent. of Hb.	Treatment.
March			
26	Jaundice developing.		Rest; fluids; diluted milk; alkali; glucose
27	9800	30	As above + strychnine gr. 1/30 bis.; camphor in oil once; blood transfusion 400 c.cm.
28	1000	30	As above, without blood transfusion.
29	—	—	As above, with blood transfusion 300 c.cm. + meat extract + jelly + sago.
30	1000	30	Normoblasts seen.
April			
1	1600	—	
	Jaundice abating.		
2	2210	40	Liq. arsenicalis ♏i. t.d.s.
5	2800	40	
9	—	—	*P. falciparum* "ring" forms seen. Quinine gr. i. + iron and arsenic t.d.s.
10	—	—	Full diet + liver. Tab. plasmochin co. — 2 daily.
12	3230	70	4 ,,
13	—	—	8 ,,
14	Temperature normal.*		9 ,,
15	—	—	12 ,,
16	—	—	12 ,,
17	—	—	Tab. plasmochin co. discontinued.
18	3700	70	No malarial parasites seen on this date nor in any subsequent examination.
22–25	—	—	Plasmochin co. 12 tab. daily.
26	3900	75	,, discontinued.
27	—	—	Mist. arsenic co. ℥i. t.d.s.
28	—	—	Patient allowed out of bed for first time for half an hour.
May			
4–7	—	—	Plasmochin co. 12 tab.
4	4250	80	—
9	—	—	Out for first drive.
10	—	—	Plasmochin co. 3 tab. daily. Tab. iron and arsenic started.
14	4490	80	—
15	—	—	Patient discharged from hospital, with instructions to continue taking quinine hydrochlor. grs. v. twice daily for the next three months.

* From this date onwards.

The maximum dose of plasmochin co. given was 12 tablets per diem; this dosage was reached gradually from an initial dosage of two tablets per diem. The plasmochin was given in short courses of decreasing length—viz., six, four, and four days—and the intervals of rest from plasmochin co. between each course increased—viz., five–eight days in this case.

Blood transfusion is not an entirely new line of treatment in blackwater fever, for Manson-Bahr and Sayers[1] record a case. Nevertheless, the results in our case, considered with the scanty records of other people's work on this line, appear to justify this somewhat lengthy account of our single case.

The clinical condition, combined with the laboratory tests of our patient on his admission on the fourth day of his illness, suggest that as a case he would come into Group II. as described by G. R. Ross.[2] Group II. cases are described as those showing "definite hæmoglobinuria of moderate severity; no suppression; recovery." These cases show Fouchet's test for bile pigments in blood + +. van den Bergh: direct—negative; indirect—5 and 16 units. If placed in this group our patient must have been in the severest attack compatible with inclusion in the group, and were it not for the fact that he was alive, almost untreated, 70 hours from the onset of blackwater, it might be justifiable to place his case in Group III.: "Cases with severe hæmoglobinuria: no suppression; death in 24 to 48 hours." These cases showed Fouchet's test + +: van den Bergh: direct—negative; indirect—6 (first day) to 20 units.

W. Kikuth[3] gives a comprehensive summary of the therapy recorded by various authors in blackwater fever, but no reference to blood transfusion appears.

Actual and Theoretical Effects of Blood Transfusion in Blackwater Fever.

1. It undoubtedly treats anoxæmia symptomatically by helping to replenish the patient's supply of red blood cells.

2. It acts as a stimulus to blood cell formation. There may or may not be an adequate stimulus already provided, but in our case the rise in the number of red cells per cubic millimetre coincided with the time at which blood rejuvenation occurs in other diseases after blood transfusion.

3. The urine in blackwater fever is loaded with albumin. The introduction of healthy blood plasma is probably advantageous.

4. It dilutes the hæmoglobin and the bile pigment already free in the plasma, and so may aid the kidney in its work of excretion.

5. It replenishes blood-volume without unduly increasing the amount of sodium chloride. Baker and Dodds[4] have shown in their work on obstruction of renal tubules during the excretion of hæmoglobin that a percentage of more than about 1 of sodium chloride is a very important factor in causing coagulation of hæmoglobin, and therefore tends to cause suppression of urine. Further, Dr. J. G. Thomson, in conversation with one of us (P. H. M.), has recounted how disappointing and sometimes even disastrous were his results in treating blackwater fever in S. Rhodesia with intravenous salines. This was, of course, before the publication of the work of Baker and Dodds in 1925.[4]

6. It provides the most natural antidote possible to the acidosis and the acid urine which Baker and Dodds have shown in the same paper to be so very important in causing coagulation of the liberated hæmoglobin.

It is noteworthy that in our case, in spite of the alkali treatment which was carried out from the start of hospital treatment, the urine was still acid to litmus on the second day—after nearly 24 hours' treatment.

7. It provides such antibodies as the donor may have in his blood against organisms which are likely to cause intercurrent infection—e.g., lung complications.

8. It does not appear to lead to further hæmolysis, provided the bloods are carefully matched. Auto-agglutination has been observed by us in severe malarial infections, and demands the utmost care to keep the temperature of the ingoing blood and of the receiving limb as near normal as possible.

9. Whether there is any specific therapeutic action against *P. falciparum* is very doubtful.

It should be noted that neither our patient nor the donor had any quinine in his system at the time of the transfusion. M. Ghiron, in his studies on the pathogenesis of blackwater fever[5] has demonstrated in vitro the marked hæmolytic action of blackwater fever serum on quininised red cells, particularly on those from a malarial patient. Transfusion of blood would therefore appear to be inadvisable at a time when the blood of either donor or recipient contains quinine. Prof. Ghiron's charts suggest that the hæmolytic system disappears from the serum of a blackwater fever patient within a month of the attack.

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[2] Ross, G. R.: Brit. Jour. Exp. Path., 1927, viii., 442.

[3] Kikuth, W.: Arch. f. Schiff- und Tropen-Hygiene, 1927, i., 501.

[4] S. L. Baker and E. C. Dodds: Brit. Jour. Exper. Path., 1925, vi., 247.

[5] Arch. f. Schiffs- und Tropen-Hyg., 1927, xxxi., 113.

Conclusions.

In view of the facts brought out by this case, it would seem that transfusion of whole blood at the time of, or immediately after, an attack of blackwater fever, provides us with a new and useful therapeutic measure in the treatment of certain types of this disease, the usual methods of rest, warmth, fluids, and alkalis of course being combined.

Further, our case suggests that the fear of causing more hæmolysis should never be allowed to prevent blood transfusion in desperate cases of blackwater fever, and that even in less severe cases transfusion may be a useful addition to treatment. We feel sure that transfusion should not be delayed until a patient is moribund, but that even at the last minute it is worthy of trial. The exhibition of tablet plasmochin co. several days after the initial hæmoglobinuria caused no further hæmolysis and it was successfully exhibited against the parasites of *P. falciparum* when they reappeared in the peripheral blood.

SOME ASPECTS OF VESICAL TUMOURS
AND THE RESULTS OF TREATMENT.

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THIS investigation began in an endeavour to ascertain the best form of treatment for papilloma of the bladder, more especially to prevent recurrences, but it soon became evident that other vesical neoplasms would have to be included. The neoplasms to which the bladder is susceptible are classified into simple and malignant, the latter being either locally or generally malignant, according to whether they invade the bladder alone or form metastases in other parts of the body. The most important simple tumour is the papilloma, which may be sessile or pedunculated, varies in size from a small pea to an orange, and possesses long villous processes. Other simple tumours, such as the connective tissue tumours which arise in childhood, adenomata arising in glands at the base, and cholesteatomata, are exceedingly uncommon and none occurred in this series.

The malignant growths which attack the bladder are the malignant papilloma, the carcinoma, and the sarcoma. In the malignant papilloma the villi are more stunted and irregular than in the benign form, the bladder wall becomes infiltrated, and the mucous membrane at the base of the tumour adheres to the submucous tissue. Carcinoma of the bladder may be a sessile nodular growth, irregular in appearance, projecting into the lumen of the bladder, and varying in size from a marble to an orange, or it may be mainly intramural with a few nodules of the surface. Sarcoma is extremely rare and is found only in infancy and late adult life. Only epithelial neoplasms occurred in this series.

The difficulty in diagnosing, in certain cases, between carcinoma and the more malignant forms of papilloma has made it necessary to include all cases of vesical new growth in this investigation. For instance, in some of the cases examined the clinical findings at operation have been those of carcinoma, but on section no pathological evidence of invasion has been found. One of the chief reasons for this is that, in the specimen removed for pathological examination, the base of the tumour has not been cut. On the other hand, tumours which to the naked eye appear to be innocent papillomata have, on pathological investigation, shown evidence of invasion. One of the chief methods of treatment of vesical new growth is diathermic cauterisation, the destruction of the growth being performed through an operating cystoscope. Specimens from these cases are not suitable for pathological investigation, so that the diagnosis rests mainly on the cystoscopic appearances. It would therefore not be justifiable to distinguish definitely between simple and malignant tumours on clinical appearances alone.

Incidence and Course.

Vesical neoplasm is a fairly common and fatal disease. Of 168 cases taken from the records of St. Thomas's Hospital between the years 1914 and 1926 only 59 were known to be alive in the latter year; 57 had died and the remainder were untraced.

The disease is most common between the ages of 50 and 65, but two patients in this series were aged 18, one being male and one female. It is more common in males than females, in the proportion of 3 to 1. The tables show the sex- and age-incidence (Table I.).

TABLE I.

Age.	Males.	Females.	Total.	Percentage.
Below 20	1	1	2	1·19
20–29	6	1	7	4·17
30–39	9	3	12	7·14
40–49	21	8	29	17·26
50–59	40	12	52	30·95
60–69	37	12	49	29·17
70–80	12	5	17	10·12
Totals	126	42	168	100·00

Of these 168 cases, only 116 could be traced up to 1926 or till death; 11 additional cases were traced for a time and then lost sight of. Up to the end of 1922, 68 cases were treated for vesical new growth. Of these, 59 were traced from the date of their first treatment until 1926 or until death. These cases, therefore, have a minimum possible post-operative lifetime of at least four years, and (as one first received treatment in 1911) a maximum up to 15 years, according to the date on which they first received treatment. The period since 1922 is too short to give a fair idea of the comparative fatality of the disease in cases treated after that year. The following table shows the number of cases treated up to the end of 1922 and the duration of life after the first treatment.

TABLE II.

Duration of life after operation.	1926.		Total.	Duration of life after operation.	1926.		Total.
	D.	L.			D.	L.	
3–6 m. ..	10	—	10	7–8 yrs. ..	3	3	6
6–12 „ ..	1	—	1	8–9 „ ..	1	6	7
1–2 yrs. ..	3	—	3	9–10 „ ..	1	2	3
2–3 „ ..	2	—	2	10–11 „ ..	—	1	1
3–4 „ ..	2	—	2	11–12 „ ..	1	—	1
4–5 „ ..	2	10	12	Over 12 yrs.	—	1	1
5–6 „ ..	2	5	7				
6–7 „ ..	2	1	3	Total ..	30	29	59

D = dead. L = Living. m = months; yrs. = years.

Only about half of these patients, therefore, are still alive, and of the 30 who are dead 20, or 66 per cent., lived less than five years after operation. A large proportion of deaths occur within six months of treatment. The fatality of this disease is just as strikingly shown in 43 traced patients who received treatment between 1922 and 1926. Only 27 of these 43, or 63 per cent., have managed to live four years and many have lived very much less, as some only received treatment in 1925. It must be borne in mind that many of these patients have had several treatments, and of those who were still alive in 1926 many still had symptoms. The two main causes of death from vesical tumours are hæmorrhage and pyelonephritis. Post-mortem reports were only found of 12 of the cases which died in hospital. The causes of death in these were :—

Hæmorrhage and cystitis	3
Pyelonephritis and cystitis	4
Uræmia	1
Bronchitis and œdema of lungs..	1
Extra-peritoneal abscess..	1
Secondary growths in viscera	2

A noteworthy feature of vesical new growths, more especially papillomata, is their tendency to local recurrence after complete removal. They may recur in the actual spot from which the original tumour was removed, or elsewhere in the bladder.

There is some evidence, though it is not conclusive, that innocent tumours do at times become malignant, as the following cases show :—

(1) Male, aged 36, a porter, was operated on on Oct. 21st, 1918, a suprapubic excision of a tumour being performed. The growth had all the naked-eye appearances of a villous papilloma, but unfortunately it was not examined microscopically. Four years later, on Dec. 14th, 1922, suprapubic excision was performed again, and the tumour, on pathological examination, was found to be a carcinoma.

(2) Male, aged 44, on whom a suprapubic excision of a bladder neoplasm was performed on Oct. 15th, 1919. The tumour was reported to be a papilloma by the pathological department. He died six years later in Southwark Infirmary on Dec. 27th, 1925, "after many operations," his death being certified as due to "epithelioma of bladder."

(3) A charwoman underwent on Nov. 8th, 1911, a suprapubic excision of a papilloma of the bladder. The diagnosis was confirmed microscopically. She was readmitted ten years later and at cystoscopy another tumour was seen. This was removed by the suprapubic route on Feb. 9th, 1921. The pathological report was "papilloma; there are also foci present at the base which must be regarded as an early carcinomatous change." She died a year later.

That even pathological examination as a means of diagnosis was not always to be depended on, the following cases show :—

(4) A governess, aged 64, was admitted to hospital in May, 1917. At cystoscopy a tumour was seen. A suprapubic cystotomy was performed on May 30th, 1917, and a growth the size of an orange was removed, together with a portion of the bladder wall which was adherent to the bowel. The left ureter was involved. One and a quarter inches of the latter were excised and the remaining portion was transplanted into another part of the bladder wall. The pathological report on the tumour was "carcinoma." Four years later the patient was again admitted to hospital with symptoms, and suprapubic excision of a tumour was performed. The pathological report on this tumour was "papilloma." The patient was still alive in 1926, nine years after the alleged carcinoma had been removed, and was free from all symptoms.

(5) A labourer, aged 60, was admitted to hospital in May, 1918. At cystoscopy a growth was seen. This was excised suprapubically on May 16th, 1918, the pathological report being "carcinoma." Three years later the patient was again admitted with a recurrence, which was excised, and also reported on as a carcinoma. He attended in January, 1926, and was then in excellent health and free from all bladder symptoms, eight years after his first operation.

In the last two cases the length of time which had elapsed since the first diagnosis and treatment of the tumour, and in which the patients had been free from symptoms, might almost be regarded as evidence against the previous diagnosis of carcinoma. In fact, as pointed out by Raymond Johnson and T. W. P. Lawrence,[1] "it is extremely difficult, if not impossible, to determine whether a papillary tumour of the urinary tract is entirely benign."

Methods of Treatment.

The age and constitution of the patient, the type of tumour, its position and size, and the amount of involvement of the surrounding structures, all have their influence on the line of treatment. Successful treatment depends primarily on early diagnosis, and the use of the cystoscope for this purpose is of enormous advantage. With the modern instrument very little experience is required. Before its introduction the diagnosis was made from the patient's symptoms, by rectal examination, and by the use of a sound.

The methods of treatment employed on the above-mentioned 168 cases were either radical or palliative. The radical treatments were as follows :—

(*a*) *Defulgurisation*, or cauterisation of the tumour by means of a bi-polar high-frequency current, applied by a pointed flexible electrode through a cystoscope, such as is used for catheterising the ureters. The other electrode consists of a flat piece of metal which is held in close contact with the patient's thigh by a bandage. The bladder is previously distended with warm normal saline solution. The part of the tumour in contact with the pointed electrode shrivels up when the current is passed, and the whole tumour is destroyed by moving the electrode. Several applications at intervals of a week or ten days may be necessary.

This method is suitable for small tumours or small recurrences. It does away with the necessity for opening the bladder and is very useful in destroying small seedlings. It cannot, however, be used when there is much hæmorrhage. This method was used alone, or previous or subsequent to other methods of treatment, in 50 cases.

(*b*) *Excision of the tumour* through a suprapubic opening into the bladder may be performed with an electric or thermal cautery, curette, or knife, according to the consistency of the tumour and its liability to hæmorrhage. The diathermic cautery prevents hæmorrhage and is said to prevent the dissemination of seedlings. (Only one case showed dissemination of growth in the scar of the abdominal wall.) Suprapubic excision was used in 85 cases, either alone or previous or subsequent to other operations.

Twenty cases were treated by both the above methods, at different times.

(*c*) *Partial cystectomy* entails removing the tumour together with the surrounding bladder wall and involved structures. The ureters may have to be transplanted into another portion of the bladder or into the colon or skin, or a urinary fistula may be established. This operation was performed five times in the series. Complete cystectomy was never done.

No other forms of radical treatment were employed.

Palliative treatment resolved itself into operative and non-operative. The operative treatment consisted in suprapubic cystotomy, with drainage or the insertion of radium into the growth. This was done in 32 cases. Non-operative treatment, consisting of bladder lavage and deep X ray therapy, was the only thing possible in 20 cases.

Recurrence and After-history.

No matter what form of treatment was adopted, recurrences were frequent. Of the 59 patients known to be alive in 1926, 34 only have had no recurrences. Six of these were treated less than two years before the end of 1926, leaving 28 who have been two years or more without recurrence. Table III. shows the number of years they have been free from symptoms, and the particulars of their treatment.

TABLE III.

Years free from symptoms.	Suprapubic excision.	Defulgurisation.	Partial cystectomy.	Total.
2	4	3	—	7
3	2	1	—	3
4	4	—	2	6
5	3	1	—	4
6	2	—	—	2
7	—	—	—	—
8	1	1	—	2
9	1	1	—	2
10	—	—	—	—
11	—	—	—	—
12	1	—	1	2
Totals ..	18	7	3	28

The number of cases among the whole 116 of the series who were traced, in which one or more recurrences took place, was 48. Table IV. shows the number of recurrences and details of their treatments. In addition to the cases tabulated one patient had an uncertain number of recurrences.

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[1] A System of Surgery. Edited by C. C. Choyce, i., 483.

To summarise: Of the 116 patients who were traced to 1926 or to a fatal termination, 59, or 50·9 per cent., were still alive in 1926; 34, or 29·3 per cent., of them had had only one treatment and had no recurrences. As shown in Table IV., 48 of the 116, or 41·4 per cent., have had one or more recurrences. The remaining patients died after a single treatment, either radical or palliative. Treatment can, therefore, only be said to have been absolutely successful in 29·3 per cent. From Table II. it will be seen that the average duration of life after operation is 5·5 years. The total number of patients who had suprapubic excision only was 31 and those who had defulgurisation only 16. The percentage of absolutely successful treatments by suprapubic excision alone was 58·4 per cent., and by defulgurisation alone 43·75 per cent.

TABLE IV.

No. of recurrences.	Suprapubic excision only.	Defulgurisation only.	Combination*	Partial cystectomy.	Total.
Once..	9	6	5	1	21
Twice	4	3	3	1	11
3 times	—	—	4	—	4
4 „	—	—	6	—	6
5 „	—	—	3	—	3
6 times	—	—	—	—	—
7 „	—	—	1	—	1
8 „	—	—	—	—	—
9 „	—	—	1	—	1
Totals	13	9	23	2	47

* Combination of defulgurisation and suprapubic excision at different times.

These figures are so small that very little value can be attached to them, and they give no indication of the type of tumour treated. Nevertheless, they seem to point to the fact that, in the large majority of cases, suprapubic excision gives the better results. Of the two patients in whom the disease occurred at the early age of 18, the male underwent a suprapubic excision in 1921 and has been free from symptoms since then. Defulgurisation on the female in 1922 was followed by two recurrences, both of which were also defulgurised, the last occasion being in 1926.

Rafin's statistics of the operation of suprapubic excision, quoted by Sir J. Thomson Walker,[2] show a mortality-rate of 3·8 per cent. in 156 cases, and recurrence in 28 per cent. The corresponding figures in this series (taken only from traced cases) were 6·2 per cent. and 43 per cent. respectively. It must, however, be borne in mind that many of the cases in this series were definitely carcinomata, whereas Rafin's statistics relate only to papillomata, and are, therefore, likely to be much more favourable.

Conclusions.

1. Epithelial vesical tumours have a high rate of mortality, in spite of treatment.
2. Males are more susceptible to the disease than females, in the proportion of 3 to 1.
3. Papillary tumours tend to recur in a large number of cases; in this series in 41·4 per cent.
4. The diagnosis of malignancy is extraordinarily difficult in many cases, and pathological examination cannot be relied upon.
5. Treatment of the tumours by means of suprapubic excision seems to yield slightly more favourable results than defulgurisation.

I should like to acknowledge my indebtedness to Sir Cuthbert Wallace, director, and Mr. B. C. Maybury, assistant director, of the Clinical Surgical Unit, St. Thomas's Hospital, for their useful suggestions and advice in the compilation of this thesis; to Mr. C. A. R. Nitch, for the use of his own records; to Mr. C. V. Patrick, late surgical registrar, for facilities in looking up the records, and to Miss J. E. Creese, secretary to the clinical units, for her valuable assistance in helping to trace a large number of patients.

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[2] A System of Surgery, ii., 912.

INFECTION WITH *B. DYSENTERIÆ* SONNE.

A FATAL CASE INVOLVING THE SMALL INTESTINE AND SIMULATING FOOD POISONING.

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THE recovery in the College of Medicine laboratory, Newcastle-on-Tyne, of dysentery bacilli from a considerable number of undiagnosed cases has led during recent years to an increase in the number of specimens submitted and a steady rise in the number of positives. The majority of the cases have been comparatively mild, with definite symptoms, but there has been a proportion, mainly in young children, with ill-marked signs, in which the disease has been fulminant and the organism isolated post mortem. An interesting point is that on more than one occasion the organism has been isolated very many hours after death; this raises the question whether its unusual persistence may not be related to an absence of bacteriophage similar to that lately described by d'Herelle and Malone[1] in acute cholera.

Until recently, all these fatalities had resulted from one or other variety of *B. dysenteriæ* Flexner, but in the following case the organism proved to be the bacillus first described by Sonne,[2] of Copenhagen, and now usually known by his name. The common experience is that this organism gives rise to mild attacks, but Mita,[3] in describing two organisms which he named pseudo-dysentery A and B, recorded six fulminating and fatal cases in a total of 73, although most of them were mild.

Smith[4] seems to claim that Mita's organisms are one and the same with *B. dysenteriæ* Sonne; their reactions, as described, are identical. Cultures, obtained from the National Collection, were found not only to give precisely similar reactions to those of the Sonne organism, but also to agglutinate well with the Oxford Sonne serum.

CASE 1.—The patient was a boy, aged 11, whose family consisted of father, mother, three sons, and a daughter. On May 16th, 1928, he had a severe headache, complained of tiredness and went to bed, but by next day had recovered. On the 20th, at about 10.30 A.M., he complained of pains in the stomach, which were succeeded by diarrhœa with brown slimy motions, and in the evening by several attacks of vomiting. At 5 A.M. on the 21st he was found in bed unconscious and incontinent. He was admitted to the Infectious Diseases Hospital at 1 P.M. the same day. He remained unconscious, vomited once—greenish fluid with mucus—and, still incontinent, with blood and mucus in the motions, he died at 8 P.M.

The post-mortem examination, held 13 hours after death, revealed marked congestion, chiefly of the ileum and cæcum and to a lesser extent of the descending colon. The adjacent lymphatic glands were slightly enlarged and there was definite splenic enlargement. The heart, liver and kidneys showed definite toxic changes. No gross pathological change was detected in the central nervous system. The stomach and a portion of small intestine and of colon were ligatured and sent direct to the laboratory, together with the spleen, but no blood could be obtained. The colon and stomach were found to contain adhesive mucus and films from the former showed inspissated epithelium. The portion of small intestine, which was inflamed, contained blood-stained liquid fæces, and films showed this to consist mainly of red-blood and pus cells.

Cultures, both direct and after brilliant green reinforcement, were sown on MacConkey plates from the contents of the hollow viscera and the spleen. No pathogenic organisms were obtained from the stomach, colon, or spleen, but the plates from the intestine showed large numbers of white colonies with crenated edge and heaped-up centre, which in 24 hours gave the reactions of *B. dysenteriæ* Flexner. They differed, however, in the following particulars, which have been found to be very suggestive of *B. dysenteriæ* Sonne. Growth was unusually profuse and there was a tendency to sedimentation, while production of acid from glucose and mannite was more marked after 24 hours than is usual with *B. dysenteriæ* Flexner. Brilliant green seemed to have comparatively little inhibitory effect, a point also noted but not recorded with a previous case.[5]

Subsequently the reactions changed in the manner characteristic of *B. dysenteriæ* Sonne, including the late clotting of milk. Nine colonies give similar reactions and with five of these agglutination was tried against polyvalent Flexner, typhoid, and a rather old "Sonne" serum. There was a total absence with the first two, but all showed more or less agglutination with the last. The most agglutinable strain was then tried against the Oxford serum, and agglutinated to practically the same titre as the homologous emulsion, although it failed to show a trace with the five Flexner-type Oxford sera.

Inquiry into Food Ingested by the Patient and the Rest of Family.

The patient appears to have partaken of the ordinary meals of the family up to May 20th, including sausage for dinner on the 19th, but none of the others showed any signs of illness at the time. In addition, he had ice-cream on the 19th and some whelks about noon of the day (20th) on which he first developed severe symptoms.

One of his brothers (A), about a month previously, together with two other boys, one (Case 2) living in the upper flat of the same house and one (B) further along the street, ate some bruised fruit and all became ill. A and B had evanescent symptoms, but Case 2 died after a few hours' illness. The father of my patient, aged 53, was ill from May 31st to June 3rd, with pains in the stomach and slight diarrhœa, which he ascribed to drinking some water from a "runner" in the country while on holiday on the 28th. None of the other members of the family seemed to have been ill.

The family, of which the second fatal case was a member, lived, as already mentioned, in the upper flat, and consisted of father, mother, and three children under 12.

CASE 2.—This boy, aged 7, after eating the bruised fruit on April 11th, became ill at 8 P.M. of that day, with pains in the head, vomiting, but no diarrhœa, and died three hours later. The death was inquired into by the coroner and a post-mortem was held, but unfortunately, owing to a misunderstanding the gut was slit from end to end during the autopsy and washed, so that when it arrived at the laboratory it was not possible to carry out a proper bacteriological examination, and no pathogenic organisms were isolated.

Dr. G. E. Stephenson, who performed the post-mortem, has kindly given an account of the findings:—

> "Stomach, duodenum, ileum and large intestine all showed hyperæmia. There was in the ileum, especially in the upper part, well-marked swelling and hyperæmia of Peyer's patches, with general hyperplasia of lymphoid tissue, there as well as in large intestine. The spleen was slightly enlarged and the liver showed an acute toxic change. No gross naked-eye change was apparent in the other organs."

This boy is said, with several others, to have had some ice-cream on the previous day, but there is no evidence to incriminate this. In addition to the three boys, the father of Case 2 is said to have suffered from diarrhœa on the night of April 11th, but otherwise there is no history of illness in the family.

The Question of a Carrier.

As soon as it was determined that the organism isolated from Case 1 was *B. dysenteriæ* Sonne inquiry was made whether any members of the two families had been in districts where the disease has been prevalent. None of the family gave such a history, but the father of Case 2 had been in Glasgow for eight months, and only returned at Easter, just before his son became ill and died. This is rather a coincidence, although there was in this case no direct evidence of the nature of the infection, and the father's blood and fæces, when examined on one occasion, proved negative. The blood and fæces of the entire family of Case 1 were examined on two occasions, and on the first an organism giving the typical Sonne reactions was isolated from the fæces of the father and the daughter. Tested against Oxford Sonne serum these proved inagglutinable, but eventually, after considerable subculture, they displayed some degree of agglutinability. Curiously enough, however, an organism was isolated in large numbers almost at the same time from an entirely unconnected case, a girl of 1½ years suffering from dysenteric symptoms, and this gave similar reactions and proved persistently inagglutinable even after subculture. The blood serum of the family of Case 1 showed no evidence of agglutinins against the organism isolated.

Discussion.

Judging from this case and from Mita's experience, it would appear that the Sonne bacillus may give rise at times to severe enteritis and fatal toxæmia. Wiseman,[6] in describing a Glasgow outbreak of enteritis due to the Sonne bacillus, has recently called attention to the occurrence of inagglutinable types of the organism. This is borne out by my case and is interesting in view of the three outbreaks of food poisoning, with three fatalities among children (recorded by Savage and Bruce White[7]), in which the organism isolated gave the reactions of Sonne and proved inagglutinable with a specific serum, although it was partially agglutinated by a serum prepared from Getting's bacillus.

No definite evidence of the source of infection could be obtained, and it is quite possible that the dietary indiscretions which preceded the illness of the two boys and the father may merely have served to fan the flame of an already existent but dormant infection. The father, at all events, was found later to be harbouring the organism.

Addendum.—Since this paper was written a very similar case has been recorded by Howel Evans.[8] Dr. W. M. Scott, of the Ministry of Health, to whom the cultures were sent, has since found that all four strains agglutinate well with a Sonne serum.

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A SIMPLE METHOD OF PERFORMING ARTHROPLASTY IN TRUE ANKYLOSIS OF THE JAW.

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CAIRO; AND DIRECTOR OF THE SURGICAL UNIT,
KASR-EL-AINI HOSPITAL.

IN the excision of the mandibular condyle surgical freedom is limited in three directions: below, retraction may stretch the facial nerve; above, the brain has more than once been injured; and, on the medial side, the internal maxillary artery lies close to the neck of the mandible. Tubby[1] figures 12 different incisions for excising the joint—a sign that none is satisfactory—and whichever the surgeon employs he is cramped if he uses ordinary tools. This constraint and risk of injury disappear with the use of the special drill devised by Hudson for opening the skull. Two advantages make this well-known drill the instrument of choice for removing bone in ankylosis of the jaw: (1) it can be used in a cramped field, thus leaving no excuse for stretching the facial nerve; (2) it jams directly it perforates, and does no injury to brain or vessel. The Hudson drill does not fail to stop provided the bone can resist sufficiently to prevent the drill being pushed through it. I have once seen the drill plunge into a dog's cerebellum but, warned by this accident, we have been able to avoid it in a series of more than 40 intracranial experiments, made in collaboration with Prof. Heathcote. We have learnt that the drill can safely be used on very thin bone if the pressure is gentle and discriminate. There is, of course, no risk of unintentional penetration when drilling the bony mass in true ankylosis of the jaw.

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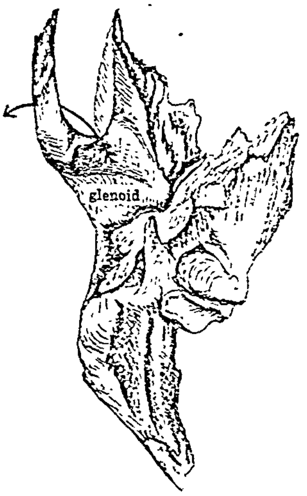
[1] Tubby, A. H.: Deformities, including Diseases of the Bones and Joints.

The Operation.

The tragus is a useful landmark, since the normal line of the joint, continued back, bisects its base. The joint lies one finger-breadth in front of it. The incision begins in front of the tragus, immediately anterior to the pulsation of the temporal artery; it extends for one and a half inches along the lower border of the zygomatic arch. From the hinder end of this cut a second is made, at right angles to the first, extending vertically for four inches above the zygoma and for half an inch only below it. This incision is, of course, a common one for arthroplasty of the jaw, and—provided the Hudson drill is used—gives good access. It is my practice here, as in every "clean" operation. to apply side-curtains. They are fixed to the skin by means of Michel clips, as I have recommended elsewhere for small or multiple incisions.[2] In this way the surgeon is not embarrassed by the handles of towel-forceps. A clip bisecting the base of the tragus marks the level of the normal joint. The site of ankylosis is exposed by displacing downwards and forwards the hindmost fibres of the masseter muscle. The three bits of the Hudson drill, usually numbered 1, 2, and 3, are used in this order to remove the ankylosing bone, just as they are used in drilling the skull. the bits numbered 2 and 3 enlarging the hole made by the first. All these jam directly they have pierced the bone.

FIG. 1.

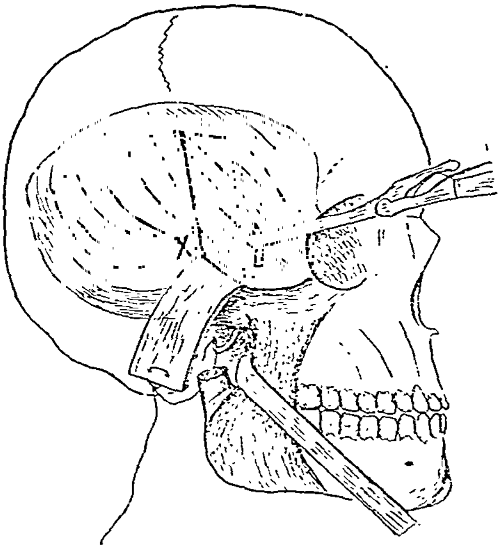


The glenoid fossa of the temporal bone seen from below, showing how the free arch of the zygoma here becomes a shelf. The suture guiding the fascial flap must—like the arrow—avoid the shelf and go *forward* under the arch.

The Fascial Flap.—A flap of fascia is next cut—either from the temporal fascia itself or from the fatty connective tissue covering it—for interposition between the neck of the mandible and the site of the glenoid cavity. Writers vaguely advise that this flap be sutured into place, which is not easy to do as the bottom of the deep, narrow wound is unsuited for placing a stitch. A neat adjustment can be made by a simple manœuvre suggested to me during an operation by my former clinical assistant, Dr. Edward Sadek. The middle part of a catgut suture is fastened to the free extremity of the flap and, by means of a curved needle, each end of the catgut is brought in turn from below upward, deep to the arch of the zygoma. The needle goes through the temporal muscle and the flap is drawn down into place by pulling on the suture; it is then made fast by knotting the ends of the catgut on the temporal belly.

The Hinge.—A detail of anatomy in the skull makes it imperative to hinge the flap in such a way that when the suture guiding it is drawn under the zygoma the flap will fully separate the raw faces of the new joint. Fig. 1 shows that it is not possible to pass a needle directly round the zygoma at the glenoid site, for at that place the free bony arch becomes a shelf attached to the skull. The needle which carries the guiding suture must, therefore, travel upward beneath the arch in a forward direction. If, then, the base of the flap is parallel to the zygoma, the fascia—strained forward by the suture and folding on a transverse hinge—will come to lie in a futile, ectopic, position in front of the glenoid site. The flap, however, can be made to lie properly by providing its pedicle with a hinge which is oblique; it then folds vertically down under the forward strain (Fig. 2). The correct slope of the hinge is obtained by cutting the flap in the form of an inch-wide strip, with its free end three inches above the zygoma, taking care that in front the incision goes right down to the zygoma, and behind stops a thumb's-breadth short. The flap, hinged obliquely in this way at the pedicle, would of itself droop backwards, but under the forward pull of the guiding suture it takes a middle course and folds straight down into place. A final stitch serves to fix the centre of motion.

FIG. 2.



The flap is outlined by a long cut in front and a short cut behind; its pedicle has therefore an *oblique* hinge. The flap folds vertically when pulled forward by the guiding suture and so covers the glenoid area. (A stitch at X fixes the centre of motion.)

After-treatment.—The patient is encouraged to chew and should begin to try when he recovers from the effects of anæsthesia. A boy, aged 15, who had had a bilateral ankylosis of the jaw for three years, was able to chew meat on the fourth day after his second arthroplasty. The first arthroplasty was done ten days before the second.

My thanks are due to Dr. Boris Boulgakow, Curator of the Museums of the Faculty of Medicine, Cairo, for the two figures which illustrate my paper. The finishing touch of the oblique hinge I owe to my wife.

LIVERPOOL OPEN-AIR HOSPITAL FOR CHILDREN.—On Saturday last the Earl of Derby opened a new artificial light and treatment block which has been added to this hospital at a cost of £17,000. In addition to the artificial light treatment rooms the block contains an operating suite, a dental department, plaster and X ray rooms, gymnasium, laboratory, and dispensary.

FEE FOR REPORT TO CORONER.—The Finance Committee of the Worcestershire County Council, having received a suggestion from the local branch of the British Medical Association that medical practitioners who supply to coroners at his request a written report in connexion with a death should be paid a fee of 10*s.* 6*d.* for the report, and having been informed that it is legal for local authorities to authorise such payment, has recommended the Council to pay the fee.

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[2] Henry, A. K.: Brit. Med. Jour., 1927, i., 663.

Clinical and Laboratory Notes.

TWO CASES OF FAMILIAL ENLARGEMENT OF THE THYMUS

ASSOCIATED WITH COLLAPSE OF LUNG.

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THE interest of these cases lies chiefly in the fact that two members of the family seem to have died of the same condition—a syndrome in which gross enlargement of the thymus is associated with the collapse of the right lung.

CASE 1.—G. W., aged 5 months, was admitted to Guy's Hospital on Nov. 10th, 1926, complaining of dyspnœa and cyanosis, which had existed since birth. The respiration was entirely thoracic and inverted—*i.e.*, the abdominal wall was retracted during inspiration. Breathing was laboured, with occasional sighing respiration. Previous to an X ray, three diagnoses were suggested: (*a*) Anterior poliomyelitis affecting the phrenic nerve. (*b*) Birth injury affecting the phrenic nerve. (*c*) Diaphragmatic hernia. An X ray examination taken without a bismuth meal showed a large opacity at the left apex which was thought to be the thymus gland.

While the patient was being given a bismuth meal for an X ray examination in view of the possibility of diaphragmatic hernia, the meal was suddenly regurgitated through the mouth and nose. He became very cyanosed and died suddenly on Nov. 11th, 1926. At the post-mortem the thymus was found to be about three times its normal size, weighing 26 g., and was partially adherent to the pericardium. There was a collapse of the upper and middle lobes of the right lung and partial collapse of the lower lobe of the right lung.

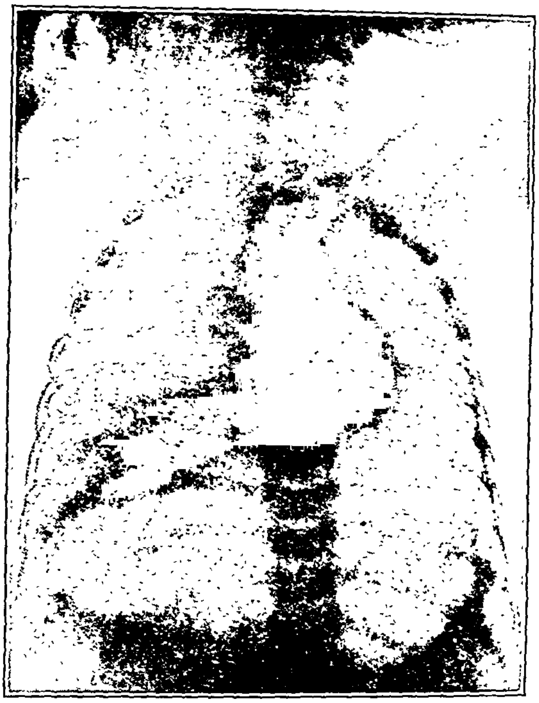
CASE 2.—E. W., sister of G. W., was admitted to the Royal Waterloo Hospital with respiratory embarrassment for observation and diagnosis on July 25th, 1928. She was 5 months old. Two months before admission she had shown signs of difficulty in respiration. This became more marked, so that the child could only feed at the breast for five minutes at a time. The confinement had been normal and the weight at birth 6 lb. 11 oz.

On admission the child was ill-nourished, pale, but not cyanosed. The finger-nails and ends of the fingers were normal. The cry was weak and infrequent. She lay in the bed with the head fully retracted, but the retraction was not fixed. The striking feature was the marked inspiratory effort, which ended in a short grunt and involved the whole accessory muscles of respiration, abdominal, thoracic, and alæ nasæ. The respiratory rate was, on an average, 45 per minute. Temperature averaged 99° F. and the pulse 140. The mouth and upper air passages were clear, the heart not displaced; rhythm and heart sounds were normal. The chest was not retracted, but there was practically no movement of the right side. The percussion note was dull from the base to the apex, both anteriorly and posteriorly on the right side. Breath sounds were very weak and distant, the air entry being very feeble. The breathing was vesicular and no adventitious sounds were heard. The left side of the chest appeared normal. Nothing abnormal could be felt in the suprasternal notch, and there was no enlargement or displacement of the liver or spleen. No enlarged glands were palpable.

A skiagram (here reproduced) showed a heavy shadow extending from the right of the mediastinum upwards into the neck; the right side of the diaphragm was elevated. The stomach was large and distended with gas. The right lung has evidently re-expanded to some extent. The shadow was compatible with thymic enlargement.

The child took her feeds well and was at the start fed partly by breast, but gradually lost weight in spite of all feeding efforts and died on August 2nd, 1928.

The *autopsy*, performed by Dr. H. W. C. Vines, showed the body of a well-nourished infant with no external injuries. When the thorax was opened, the thymus appeared to be enlarged, the lungs collapsed and small. The thymus weighed approximately 56 g. The lungs were slightly congested. The left lung floated in water, but the right (smaller) lung did not. Their appearance suggested collapse or failure to expand rather than pathological consolidation. The trachea showed no gross evidence of compression. The heart showed minute petechial hæmorrhages under the visceral pericardium. The veins were dilated. The liver, spleen, and kidneys were congested. The intestines did not show any very marked enlargement of the lymphoid follicles. There were numerous rather enlarged lymph glands in the mesentery. The cortex of the suprarenals appeared to be rather thin, and the medulla not very evident. There was no evidence of hæmorrhage. Microscopically, the thymus appeared active and vascular. Hassall's corpuscles were numerous and large. The lung showed collapse and congestion; the mesenteric lymph glands simple enlargement. In the suprarenals the medullary cells were present in patches, but appear to have been replaced by vascular connective tissue.



CASE 2.—Skiagram showing heavy shadow extending from the right of the mediastinum upwards into the neck.

Remarks.

In a large number of post-mortem examinations where death has occurred either under anæsthetic or suddenly in young children, I have found a large thymus, but have never previously observed any collapse of the lung. These, however, have been acute cases where there has been no previous history of respiratory distress. In Case 2 there was no evidence of tracheostenosis or compression. It is difficult to say definitely whether the right lung had ever expanded or whether the collapse was of post-natal origin. The absence of recession and the non-displacement of the heart, together with the X ray appearances, would seem perhaps to indicate a gradual collapse.

Dysthymic constitutions are well recognised as having constitutional disturbances, delayed growth, and sometimes rickety changes. The noisy respiration, with a slight souffle, best heard in the horizontal position, are well known. Acute phenomena pass away but leave the child in a state of torpor which may give rise to anxiety. Percussion and skiagrams, especially when there is a large mediothoracic shadow, greatly increased in its upper part, may give a clue.

Various reasons have been suggested for death due to thymic conditions—*e.g.*, vagal stimulation, compression of inferior cardiac nerve, stimulation of cardiac centres producing inhibition, compression of phrenic nerve producing diaphragmatic paralysis, lymphotoxæmia. Much discussion has centred round the question as to whether direct pressure of the thymus on the trachea is responsible for the dyspnœa.

In Case 2 the retraction of the head would tend to project the vertebræ forward and diminish the superior opening of the thorax. Since the enlargement was chiefly on the right side, obstruction, if obstruction there was, would probably be on the right main bronchus, causing the abnormal condition of the right lung. There was no evidence of tracheostenosis in this case and none to support J.-A. Hammar's contention that most cases of thymic death are due to compression of the trachea. Through the courtesy of Dr. F. Parkes Weber, I have traced an account[1] of familial sudden thymic death, but in the cases recorded above death was not sudden or unexpected.

I have been unable to trace in the literature a description of familial cases with enlargement of the thymus associated with a collapsed condition of the right lung.

I am indebted to Mr. H. L. Eason and Dr. H. C. Cameron, of Guy's Hospital, for the account of Case 1, and to Dr. A. S. Woodwark for permission to publish Case 2. I should also like to thank my house physician, Dr. C. G. Walker, for help with the clinical investigation.

A CASE OF ANEURYSM OF THE MITRAL CUSP.

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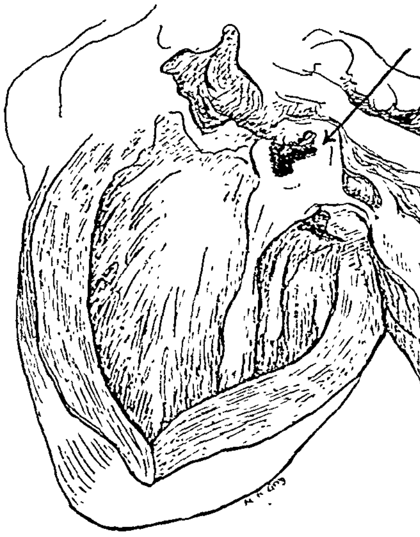
DURING the course of malignant endocarditis bacterial emboli break off from the affected valves and are distributed all over the body. These emboli cause septic infarction of the organs in which they are arrested. When, as not uncommonly occurs, the site of arrest is a vas vasorum, a mycotic aneurysm may follow; this event may take place in any artery. Osler reports a case in which five such aneurysms were present in the thoracic aorta. Many other cases have been put on record, and every artery of any size has been affected. More rarely the site of aneurysm formation is the heart itself, and in such cases the lesion may involve the valves. According to Osler (System, 1908), the commonest site for such an aneurysm is the aortic valve, in which case the cusps are dilated towards the ventricle. Less commonly, a similar condition occurs in the mitral valve, the aortic cusp being more frequently affected than the posterior. In any of these sites the aneurysm may rupture or may be filled with fibrin. The following case illustrates the commoner type of mitral aneurysm.



Drawing of heart showing aneurysm of the mitral cusp.

A girl of 15 was admitted into Ancoats Hospital under the care of Dr. Kletz on Feb. 2nd, 1928, suffering from pyrexia. The previous history showed measles and chickenpox. For many years she had been troubled with rheumatic pains and stiffness of the knees, but recently she had been free from them. Her present illness began insidiously at Christmas, 1927, with headache and severe lassitude. During the first week in January she had a sensation as of a purple veil drawn over the outer half of the visual field of the right eye. After a few days this disappeared. She then tried to resume work but had to return to bed. The headache increased in severity during the last week before admission; she became very short of breath and purple painful spots appeared on the fingers and toes, remained for a day or so and disappeared. The sensation of the purple veil over the right eye returned. For a day or so she complained of pain in the right loin, but had no hæmaturia. There had been no indigestion and the bowels were regular.

Examination.—Patient was extremely pale, with a floury skin and slight malar flush. Intelligence and cheerfulness above normal, as is frequently noted in this disease. Nothing abnormal was found in the alimentary and respiratory systems. The apex-beat was found in the sixth space in the anterior axillary line. A very harsh systolic murmur was heard in the mitral area. This was propagated to the axilla and was heard behind. There were systolic and presystolic murmurs in the aortic area. The heart rhythm was regular. Blood pressure was 110/80. There were some petechiæ, red and painful to touch, the feet and conjunctiva being most affected. There was a small hæmorrhage in the macular region of the right fundus oculi, which probably accounted for the purple veil sensation.

During the course of the disease, which lasted for three weeks in hospital, no change was found in the heart. The temperature was swinging up to 102° F., but blood culture was negative. At no time was the spleen felt.

Post-mortem Examination.—The heart was much enlarged. The right side was normal, the left side greatly hypertrophied and dilated. The mitral valve was encrusted with recent vegetations. In the aortic cusp of the valve was an aneurysm extending three-quarters of an inch into the auricle. This was ruptured at its apex, and the margins were covered with vegetations. The aortic valve was also scarred and encrusted with recent vegetations. The only other abnormality found was an old infarct of the left kidney.

In all probability the rupture of the aneurysm had taken place some weeks previously and the resulting incompetence was responsible for the harsh systolic murmur.

I am indebted to Dr. Norman Kletz, under whose care the patient was admitted, and to Dr. Arnold Renshaw, pathologist to the hospital, for permission to publish this case.

THE BROMSULPHALEIN TEST IN EARLY DISEASE OF THE LIVER.

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THE bromsulphalein test for liver function, introduced by Rosenthal and White,[1] depends upon the capacity of the liver cells to remove the dye phenoltetrabromphthalein sodium sulphonate from the blood stream and excrete it in the bile.

These authors found that when a certain amount of the dye—2 mg. per kg. of body-weight—was injected intravenously, none of it could be demonstrated in the blood 30 minutes later if the liver were normal. In marked liver disease, however, there was retention of dye, the amount retained being apparently proportionate to the degree of damage to the liver. No cases of early liver disease were examined by Rosenthal and White, but they suggested that the amount of dye retained five minutes after the injection would indicate the extent of the liver insufficiency. In their series of normals the dye retention at the five minute interval varied from 20 to 50 per cent., with an average of 35 per cent. There were no local or general ill-effects from the use of the dye.

Others have made use of this test, and report favourably on it as a hepatic function test in advanced disease of the liver. Friedenwald and Armstrong[2] found retention of the dye in catarrhal jaundice,

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[1] Handbuch der Kinderheilkunde, 3rd edition, vol. i., 1923.

TABLE I.—*Early Disease of the Liver.*

Sex.	Age.	Clinical diagnosis.	Units of bilirubin in serum.	Blood-sugar per cent. Before lævulose.	½ hr. later.	1 hr. later.	1½ hr. later.	2 hr. later.	Rise in mg. per cent.	Bromsulphalein test. Percentage of dye retained. 5 mins.	30 mins.
M.	26	Manganese toxæmia.	0·5	0·102	0·117	0·133	0·117	0·112	31	15	0
M.	40		0·25	0·083	0·108	0·105	0·104	0·101	25	10	0
M.	40		0·5	0·090	0·120	0·121	0·120	0·120	31	20	0
M.	25		0·5	0·090	0·090	0·095	0·095	0·090	5	30	0
M.	39		0·25	0·099	0·105	0·097	0·093	0·089	6	10	0
M.	21		0·5	0·101	0·115	0·112	0·093	—	14	25	0
M.	55		0·5	0·108	0·129	0·122	0·122	0·111	21	15	0
M.	28	Banti's disease.	0·5	0·098	0·110	0·133	0·125	0·104	35	10	0
M.	15		0·5	0·097	0·133	0·130	—	0·130	36	20	0
F.	47		0·5	0·100	0·137	0·114	0·104	0·102	37	15	0
M.	37	Catarrhal jaundice.	7	0·136	0·156	0·185	0·173	0·166	49	20	0
M.	21		8	0·085	0·101	0·124	0·117	0·114	39	15	0
F.	46		2·5	0·100	0·115	0·124	0·138	0·123	38	20	0
F.	27		14	0·102	0·134	0·126	0·108	0·104	32	10	0
M.	64		4	0·113	0·150	0·136	0·133	0·120	37	25	0
M.	26		6	0·097	0·115	0·152	0·134	0·126	55	15	0
M.	60	Specific liver.	9	0·110	0·129	0·133	0·142	0·133	32	10	0
F.	19	Acholuric jaundice.	7	0·100	0·129	—	0·120	0·103	29	20	0
F.	35	Hyperemesis gravidarum.	8	—	—	—	—	—	—	15	0
F.	47	Familial jaundice.	8	0·080	0·131	0·120	0·114	0·109	51	10	0

cirrhosis of the liver, and carcinoma of the liver. A negative result in two cases of cirrhosis of the liver with free abdominal fluid was regarded by them as due to compensatory hyperplasia of liver cells. Vaughan's[3] opinion was that in obstructive jaundice, and in jaundice due to liver damage, the bromsulphalein retention agreed roughly with the bilirubin retention. King[4] and Siegel[5] considered that the test might prove useful for the differentiation of nephritic and pre-eclamptic types of toxæmia and of neurotic and toxic vomiting.

To determine the usefulness of this test in early liver disease a series of patients with suspected minor degrees of liver insufficiency were chosen, and the lævulose-tolerance and bromsulphalein tests were compared. In each case also some indication of the degree of disturbance in pigment metabolism was obtained by estimating the blood bilirubin by van den Bergh's method. The technique used in the dye test was as recommended by Rosenthal and White, and the bromsulphalein was obtained in 5 per cent. solution from Messrs. Hynson, Westcott, and Dunning, of Baltimore, U.S.A. The exact quantity, in cubic centimetres, of this 5 per cent. solution to be injected was obtained by dividing the patient's weight in pounds by 55. The amount of dye retained in the blood was determined at intervals of 5 and of 30 minutes.

For the lævulose-tolerance test half-hourly estimations of the blood-sugar were made for two hours after the ingestion of 50 g. of lævulose on a fasting stomach. A rise in the blood-sugar of 20 mg. with a non-return to normal was considered positive.

The results of these tests are given in Table I., and the figures obtained with the dye test in six normal individuals are shown in Table II.

TABLE II.—*Normals.*

Sex.	Age.	Bromsulphalein test. Percentage of dye retained. 5 minutes.	30 minutes.
F.	44	25	0
M.	32	15	0
M.	45	20	0
M.	38	10	0
F.	26	15	0
M.	52	15	0

Summary and Conclusions.

Of 20 cases with early liver disease the lævulose-tolerance test was positive in 16, while the bromsulphalein content of the blood serum 5 and 30 minutes after injection of the dye showed no variation from the normal. Ten of the 16 had bilirubin retention. The five-minute interval retention of bromsulphalein does not appear to afford much information in early liver disease, nor does the retention of bromsulphalein run parallel with the bilirubin retention.

I am indebted to my colleagues on the staff of the Bristol Royal Infirmary for their kindness in allowing me to examine their patients.

References.—1. Rosenthal, S. M., and White, E. C.: Jour. Amer. Med. Assoc., 1925, lxxxiv., 1112. 2. Friedenwald, J., and Armstrong, W. W.: Med. Jour. and Rec., 1926, cxxiv., 679. 3. Vaughan, S. L.: Bull. Buffalo Gen. Hosp., 1927, v., 3. 4. King, E. L.: Amer. Jour. Obst. and Gynec., 1926, xii., 577. 5. Siegel, I. A.: Ibid., 1927, xiv., 300.

INTERNATIONAL HOSPITAL CONGRESS, 1929.—On August 29th, at the headquarters of the League of Red Cross Societies in Paris, a meeting was convened of the International Executive Committee of the International Hospital Congress, of which Dr. René Sand, Technical Counsellor of the League of Red Cross Societies, is chairman, and Dr. Lewinski-Corwin, Director of the Hospital Information and Service Bureau, United Hospital Fund, U.S.A., is secretary-general. Great Britain was represented by Mr. J. Courtney Buchanan, honorary secretary of the British Hospitals Association; Mr. W. H. Harper, house governor of the Wolverhampton and Staffordshire Hospital; and Mr. G. Watts, representing the Incorporated Association of Hospital Officers. The committee agreed with the American Hospital Association in its proposal to hold the International Congress at Atlantic City on June 13th–15th, 1929. In accordance with the practice of the American Hospital Association, the Congress is to be open to hospital administrators, physicians, surgeons, nurses, architects, engineers, and others interested in hospital problems. Official invitations are to be sent to the various Governments through the Secretary of State in Washington, and at the same time a questionaire will be sent to each country on its hospital situation and statistics. The American Hospital Association proposes to organise a tour of inspection of the hospitals of New York, Philadelphia, Baltimore, and other centres for the benefit of the official delegates from June 5th to 12th. The object of the Congress, the first of its kind, is to facilitate personal contacts, to provide for exchange of information, and to promote discussion among persons interested in hospitals throughout the world, whether public or voluntary. The preliminary programme provides for an address on essential hospital functions, and this will be followed by discussions on hospital planning in relation to economy and efficiency, the problem of hospital economies, the respective fields of public and private hospital work, the questions related to psychopathic hospitals and hospitals for chronic disease, and various other matters such as the creation of an International Hospital Association. For further particulars of the International Hospital Congress, the membership fee of which is five dollars, inquiries should be addressed to Dr. René Sand, 2, Avenue Velasquez, Paris VIII.; or to Dr. E. H. Lewinski-Corwin, the American Hospital Association, 2 East 103rd Street, New York.

Reviews and Notices of Books.

THE GENESIS OF EPIDEMICS.

By CLIFFORD ALLCHIN GILL, M.R.C.S., L.R.C.P., D.P.H., D.T.M. & H. Eng., Director of Public Health, Punjab. London: Baillière, Tindall and Cox. 1928. Pp. 550. 21s.

THE havoc wrought throughout the world by epidemic diseases makes the solution of the problem of their causation one of peculiar interest and importance. Theories and speculations to account for their occurrence have not been lacking; and, although many of these have been proved to be inconsistent with the facts revealed by advancing medical knowledge, there is still no unanimity of opinion among epidemiologists. It is only from prolonged and systematic effort to collect, arrange, and correlate all the facts that a consistent and intelligible theory is likely to emerge. We are, therefore, indebted to Dr. C. A. Gill, director of public health in the Punjab, who has published the outcome of a painstaking study of epidemics, in particular of malaria. The subject matter is presented in five parts, of which the first is introductory, consisting of a brief account of the views held by various authorities as to the cause of epidemics, a critical analysis of the methods employed in epidemiological research, and a summary of the author's own theory of the genesis of epidemics. The material from which the theory has been evolved is presented in detail in the second part of the work, where an interesting account of the investigation of epidemic malaria is followed by a note on the epidemiological features of influenza and plague. Since epidemicity is confined neither to diseases of which the causative organisms belong to closely allied groups nor to those exhibiting similar modes of transmission, these three widely diverse diseases are well chosen as examples. In Part III. the general applicability of Dr. Gill's theory to all epidemiological phenomena is examined and discussed, while Part IV. is devoted to a consideration of the response of disease to the influence of evolution and the effect of climate on health and disease in the light of the views propounded in the preceding chapters. Finally, in Part V., the failure of certain diseases to assume epidemic and pandemic characteristics is shown to be in no way inconsistent with the general argument: certain practical deductions from the study are summarised, and their bearing on the practice of preventive medicine reviewed.

As a result of his study, the author has come to the conclusion that the generic features of all epidemics, irrespective of the nature of the *materies morbi*, are the outcome of the same mechanism. "Nature exhibits a remarkable unity of design, and it would, therefore, be as unnatural to anticipate a separate mechanism of epidemicity in each specific disease as to assume a separate act of creation in the case of each zoological species." Dr. Gill's theory as to the nature of this mechanism—the quantum theory—postulates that the essential factor in the causation of epidemics is a loss of equilibrium between the dose of toxin and the degree of resistance, or, in short, between infection and immunity. If we regard an epidemic as the analogue in the community of an attack of disease in the individual, the theory is simply an extension of existing knowledge concerning individual infection, involving, therefore, neither the adoption of any new principle nor the formulation of any fresh hypothesis. If this theory be ultimately found to fit all the facts, the complexity of the problem will be materially reduced and future investigation simplified. The arguments presented in its favour are skilful, but not always convincing. For example, the author says, "a sudden depression of communal immunity is less likely to occur than a sudden increase in the amount of infection, and it is consequently held that circumstances conducive to a sudden increase of the infection quantum play a predominant part in epidemic explosions." An epidemic visitation is undoubtedly a sudden upheaval; but there is no apparent reason why the forces requisite to lead to a "loss of equilibrium" should be assembled in an equally dramatic manner. A gradual increase of susceptible persons—i.e., a gradual decrease in communal immunity—has, on this theory, as much chance of ultimately upsetting the balance as a gradual or sudden increase of the infection quantum. Again, "since, during their passage from one human host to another parasites are exposed, directly or indirectly, to the influence of meteorological conditions and atmospheric states, it is held that the latter are intimately concerned in determining the frequency and intensity of epidemics." This point of view has led Dr. Gill to attribute great prominence in the genesis of epidemics to meteorological conditions. It need only be noted that the length of exposure of organisms during their passage from one human host to another, at least in diseases spread by direct transmission, must be small; that under laboratory conditions, where meteorological variations are almost negligible, epidemics tend to occur and recur, and that the host as well as the parasite is susceptible to changes in weather conditions.

However, the author admits freely that the thesis put forward in this volume embodies few certainties and will occasion many doubts, and while his explanations are not entirely convincing, the detailed presentation of the facts leaves nothing to be desired, and on this account alone the work deserves warm commendation.

SURGERY OF CHILDHOOD.

By RICHARD WALTER BOLLING, M.D., F.A.C.S. Attending Surgeon, St. Luke's and Babies' Hospitals, New York City. London and New York: D. Appleton and Co. 1928. Pp. 390. 16s.

THIS book forms Vol. XV. of a series on clinical pædiatrics. The title of the volume is more comprehensive than its contents, since these do not include orthopædic subjects. There is thus no reference to talipes, congenital dislocation of the hip, or birth palsies, though 50 pages are devoted to fracture and epiphyseal separation. Joint tubercle has apparently been considered in Vols. VI. and VII., and hydrocephalus in Vol. V. We are not told where to look for a consideration of the tonsils and of mastoid infections: they receive scant notice in the volume under review. There are over 200 illustrations, and the X ray reproductions gain considerably by presenting the normal as well as the abnormal. This is a feature which might be widely imitated with advantage.

The book contains little that is new or provocative. Tannic acid in the treatment of burns and scalds is very properly advocated, but blood transfusion is advised for more conditions than most surgeons would consider necessary. A few of the author's opinions —e.g., those on appendicitis (p. 309)—are not generally held, but on the whole the book contains sound teaching. If it lacks balance and cohesion the fault lies partly in the scheme of producing units in a series of monographs.

PYODERMITES ET ECZÉMAS.

By Dr. R. SABOURAUD. With 149 original illustrations in the text. Paris: Masson et Cie. 1928. Pp. 284. Fr.60.

IN this work, the fourth of a series which includes previous volumes on seborrhœic dermatitis, squamous groups, and mycelial infections of the skin, the author presents a most comprehensive and careful study of the cutaneous coccal infections and their eczematous complications. Clinical photographs of typical cases, and many admirable microphotographs and diagrams depicting the actual causal organisms in situ, amplify the text and illustrate the immense scope of a subject which is here considered in three main sections, a fourth being devoted to treatment.

In the first section are described the various ways in which staphylococci can gain access to the skin; the frequency with which *S. aureus* is recovered on culture; the peculiar type of perifollicular abscess, the furuncle, and its necrotic sequela; Bockhardt's impetigo (which is not a streptococcal infection), and the consecutive alopecia sometimes noted in hairy regions. In the second chapter of this section the various forms of sycosis, nail infections and granuloma pyogenicum, due to *S. aureus*, are considered with a scrupulous regard for accuracy.

Section 2 is devoted to the streptococci. Impetigo is discussed in detail; intertrigo and its eczematous complications are then described, and eczema is considered from the bacterial aspect. It is admitted that the universality of the cocci and their low-grade specificity render all conclusions based on bacteriological findings vague and uncertain. The ætiology and nosological relationships of "eczema" are further elaborated in section 3. Some of the terms used, for example "eczematides," "coccides," introduce a finesse of diagnosis which makes a special appeal to the dermatologist, but which nevertheless has a practical bearing referred to later in the section on treatment. The study of this complex elaboration is much assisted by the photographs of actual cases, many of which recall the multiplicity of clinical types in which the author is striving to create some semblance of order, a task for which his famous treatise on the ringworm fungi has especially fitted him. The final section is a therapeutic synopsis of methods and formulæ of the old and well-tried French school. The lucid table of contents and a complete international bibliography are additional features in a most admirable production.

THE ULTRA-VIOLET RAYS.

Their Action on Internal Diseases and Use in *Preventing Loss of Colour and Falling of the Hair*. By ARNOLD LORAND, M.D. Vienna, Physician at the Carlsbad Springs, Czecho-Slovakia. Philadelphia: F. A. Davis Company. 1928. Pp. 258. $2.50.

THE title of the volume leads one to expect a study of the action of ultra-violet light on digestive, nervous, and ductless gland diseases. This has not been supplied; no effort has been made to study the action of light, apart from the many other methods of treatment employed, and no series of comparative cases is given. The statement is made here and there that better results were obtained when light treatment was superimposed on other methods, including gland extracts, iodine, mud-packs, and mineral spring water cures. The dosage employed is seldom stated in precise terms and the degree of erythema aimed at is not always given. The author attributes the reddening of the skin in strong sunlight to an irritation of the blood-vessels of the skin, and says that for this to occur the sympathetic (splanchnic) must positively be involved (p. 27). The book contains innumerable dogmatic statements for which no scientific proof is adduced. Dr. Lorand advocates light treatment as a means of lessening pain—e.g., by irradiation of the gall-bladder area in cases of gall-stones—and claims that the symptoms of old age are alleviated by the use of the mercury-vapour lamp; here, again, he does not limit treatment to ultra-violet light, but gives extracts of ductless glands and iodine as well (p. 95). The use of ultra-violet light for cosmetic purposes will hardly recommend itself to actinotherapists. The author states that after desquamation has occurred the complexion improves and that wrinkles disappear. It must be remembered, however, that mercury-vapour reactions are, as a rule, very painful, that turgescence of the skin is mostly transitory, and that this treatment may stimulate hair-growth in any irradiated part, not on the scalp only. The author's claim that light treatment is efficient in reducing obesity and in lowering blood pressure (apart from a small temporary fall) is not upheld by other investigators in this field; but since he uses light mainly as an auxiliary treatment, he is not really in a position to make specific claims for its efficacy. Several chapters are devoted to the subject of the action of light in stimulating hair-growth and to the treatment of greying hair, the work of Nagelschmidt in this field being duly acknowledged.

We have nothing but praise for the way in which the book is published; the clear type, the good binding, and light weight, are an achievement at the moderate cost of $2.50.

SPINAL NEURO-SYPHILIS.

La Syphilis Médullaire. By Dr. LORTAT-JACOB, Physician to the Saint-Louis Hospital, Paris; and Dr. POUMEAU-DELILLE, Interne of the Paris Hospitals. Paris: *Masson et Cie.* 1928. Pp. 151. Fr.70.

THIS volume belongs to the series entitled *Collection Médecine et Chirurgie Pratiques*, and contains in a concise form, for student and practitioner, present-day information on the varieties of spinal neuro-syphilis, their pathology, semiology, differential diagnosis, and treatment. Tabes dorsalis is excluded, for no very obvious reason; combinations of tabes with amyotrophy, with lateral column involvement, with incomplete transverse "myelitis" are not so infrequent as to suggest a fundamentally differing ætiology for parenchymatous as compared with interstitial manifestations, but the authors describe only the meningovascular types under the chosen title. A good account is given of acute and chronic meningomyelitis, gummatous forms, syphilitic muscular atrophy, and of rarer groups such as syphilitic combined sclerosis, and spinal compression of syphilitic origin. A place is found for "pseudo-tabes syphilitique" and "pseudo-sclérose en plaques syphilitique," although in our view these terms are misleading and should be abandoned. Neither of them should be characterised with the epithet "pseudo," for the former is merely a tabetic variety with overflow from the posterior funiculi, while the latter is a multiple, disseminated, syphilitic "myelitis." On the other hand, attention might have been drawn—since rarities are included—to the interesting combination of systematised posterolateral sclerosis with amyotrophy.

The purpose of the authors, however, is well served by this little vade-mecum.

GONOCOCCAL URETHRITIS IN THE MALE.

By P. S. PELOUZE, M.D., Associate in Urology and Assistant Genito-Urinary Surgeon, University of Pennsylvania. London and Philadelphia: W. B. Saunders Company. 1928. Pp. 357. 24s.

IN this small monograph Dr. Pelouze has produced an excellent summary of modern methods in the diagnosis and treatment of gonorrhœa in the male. Methods of culture and identification of the gonococcus are described; a feature of particular interest is the application of the action of the bacteriophage in the differentiation of the pathological urethral flora. Special attention is drawn to the need of employing a culture medium of correct hydrogen-ion concentration. In view of recent enthusiasm about the use of diathermy in the treatment of gonorrhœa, the survival of gonococci in the author's cultures after exposure to a temperature of 113° F. for 30 minutes, is noteworthy. In an admirable account of the pathological aspects of this condition, based chiefly on the classical work of E. Finger, Dr. Pelouze suggests that the spread of infection from urethra to epididymis is due to the passage of infected urine along the vas deferens. He comments on the low incidence of infection of the seminal vesicle in comparison with that of the epididymis and assumes that the former has natural immunity to infection. Surgical treatment for chronic infection of the seminal vesicles is advised only as a last resort. In the section on treatment, no new departures are recommended; neither

vaccines nor diathermy have yielded very favourable results in the author's experience, and the action of acriflavine and mercurochrome has proved disappointing. The main maxims set out are thoroughness in diagnosis and gentleness and patience in treatment.

The volume terminates with an excellent selection of typical case histories followed by the author's comments. Readers will find this small book both refreshing and stimulating, but some will be disappointed by the brevity of the practical details of technique in treatment.

MODEL ANSWERS TO QUESTIONS FOR MENTAL NURSES set by the General Nursing Council. By HECTOR MACPHAIL. London: The Scientific Press; Faber and Gwyer, Ltd. 1928. Pp. 273. 5*s*.

THIS companion volume to the author's well-known book, based on the questions set for the Medico-Psychological certificate, will be found equally useful by students. His skill in putting clearly and concisely the essential points required for the perfect answer is beyond praise. In the anatomical section there are, perhaps, rather more technical terms than are really necessary, and the phraseology of the answers is rather that of the medical student than that of the nurse. In the section on mental diseases and psychology this fault has been ably avoided. A few minor points call for criticism: the definition of seclusion on p. 227 has not been brought up to date; on p. 147 para. 11 has been reversed, making incontinence characterise fainting and not epileptic fits; and an answer on glycogen omits mention of its storage in the muscles; but, generally speaking, the book is remarkably free from errors, and so pleasantly written that it will be found an attractive aid to study.

THE RELATION BETWEEN LABYRINTH AND OCULAR MUSCULATURE.

Die Labyrinthreflexe auf die Augenmuskeln nach einseitiger Labyrinthextirpation. By Dr. R. LORENTE DE NÓ, Assistant in the Cajal Institute, Madrid. With 186 figures in the text and 22 plates. Berlin and Vienna: Urban and Schwarzenberg. 1928. Pp. 205. M.15.

THE work performed for Dr. Lorente de Nó's monograph has been conceived and carried out on a high level of scientific knowledge and skill. The book gives the reader an insight into the technical and other difficulties and complexities surrounding the investigation of the relation between labyrinth and ocular musculature, and is far from easy reading. Probably it is well that this should be so; Dr. de Nó is at pains to point out that in regard to the actual anatomical connexions of central labyrinthine structures ignorance is not by any means dispelled, and if this is true of morphology it is truer still of physiology. His book deals only with one aspect of labyrinthine function, yet it is based on uninterrupted researches during a number of years. The major portion is taken up with protocols of a large number of personal experiments, mainly on guinea-pigs, in which the labyrinth has been extirpated and ocular movements studied by a special technique. The author gives us a highly technical discussion of his own conclusions and of those of others, which is of interest mainly to the specialist, and which, moreover, embodies abstruse mathematical data with which few can be familiar. Incidentally, he is critical of certain findings as to the causation of decerebrate rigidity, and claims that his experiments are not in harmony with the teaching of Rademaker and others of the Magnus school. The monograph does not lend itself readily to summarisation, in view of its peculiarly technical character. Possibly its chief problem is that concerned with the quick phase of nystagmus; the author's experiments lead to the view that for the occurrence of this phenomenon the substantia reticularis of the pons must be intact and that its neurones must be in relation with the central nuclei of the labyrinthine system. He considers that both quick and slow components result from peripheral labyrinthine excitations, not, however, corresponding to separate end-organs; on the contrary, his opinion is that a peripheral stimulus starts a diphasic reflex from a given semicircular canal, comparable to the awakening of the scratch-reflex in the spinal animal by a single cutaneous impression.

CLINICAL GYNÆCOLOGY AND OBSTETRICS.

A Handbook of Clinical Gynecology and Obstetrics. By R. T. LA VAKE, A.B., M.D., F.A.C.S., Assistant Professor, Obstetrics and Gynecology, University of Minnesota. London: Henry Kimpton. 1928. Pp. 281. 18*s*.

IT is difficult to place this book into any definite category. It is not a systematic text-book, nor does it treat any definite part or aspect of gynæcology. The writer's object seems to be the correction of the perspective of the practitioner or student who has made a thorough study of encyclopædic text-books and is left "in a daze of countless facts and details arranged according to the demands of logical and complete exposition rather than according to practical importance." Granting that there is a class suffering from the consequences of encyclopædic study, the need for a corrective becomes obvious, and probably this book will serve as well as any other.

The book, then, is a medley of the author's teaching on those points of gynæcology and obstetrics—chiefly the latter—which he considers of clinical moment and on which he feels he has something to impart. Orderly arrangement is entirely absent. Part I. begins with gynæcological examination and diagnosis, and a chat on displacements follows; a diversion then occurs to pelvimetry and obstetrical diagnosis, and post-partum examination, after which we are switched back to gynæcological conditions considered on a pathological basis. Part II. is almost wholly obstetrical, the subjects apparently being taken in the order of their prominence in the maternal mortality list. It begins with sepsis, toxæmia of pregnancy, and hæmorrhage, after which follow obstetric operations, malpresentations, repair of birth injuries, post-partum care, and alleviation of pain in labour.

Much of the matter is excellent and the work throughout is eminently clinical and practical; the modification of treatment to meet the particular patient is emphasised. The book will interest and instruct those who are in the mood to browse here and there as their inclination may direct.

JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES. Vol. XXV. July–September.—Dr. A. P. Cawadias contributes a paper on treatment of chronic polymicrobian colitis in children, in which he maintains that better therapeutic results would be obtained if the pathology of the disease were taken into account and a more thorough clinical diagnosis was made, especially as regards what Tendeloo calls the "constellation" of ætiological factors of the disease.—Dr. F. Parkes Weber records a case of temporary pulmonary œdema in a leukæmic child during a stage somewhat resembling aplastic anæmia. The patient was a boy, aged 14, suffering from lymphatic leukæmia of the undifferentiated cell type, in whom acute pulmonary œdema followed blood transfusion.—Dr. Hazel H. Chodak Gregory reports a case of splenectomy for purpura hæmorrhagica in a boy aged 7 years. When seen ten months after the operation he was in good condition. The spleen, which was enlarged and weighed 2¼ oz., was connected by dense adhesions with the anterior abdominal wall, which suggested some primary inflammatory lesion of the spleen and its covering peritoneum as a possible cause of the disease.—Dr. J. D. Rolleston describes a case of non-surgical subcutaneous emphysema in laryngeal diphtheria. The patient was a girl, aged

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vaccines nor diathermy have yielded very favourable results in the author's experience, and the action of acriflavine and mercurochrome has proved disappointing. The main maxims set out are thoroughness in diagnosis and gentleness and patience in treatment.

The volume terminates with an excellent selection of typical case histories followed by the author's comments. Readers will find this small book both refreshing and stimulating, but some will be disappointed by the brevity of the practical details of technique in treatment.

Model Answers to Questions for Mental Nurses

set by the General Nursing Council. By Hector MacPhail. London: The Scientific Press; Faber and Gwyer, Ltd. 1928. Pp. 273. 5s.

This companion volume to the author's well-known book, based on the questions set for the Medico-Psychological certificate, will be found equally useful by students. His skill in putting clearly and concisely the essential points required for the perfect answer is beyond praise. In the anatomical section there are, perhaps, rather more technical terms than are really necessary, and the phraseology of the answers is rather that of the medical student than that of the nurse. In the section on mental diseases and psychology this fault has been ably avoided. A few minor points call for criticism: the definition of seclusion on p. 227 has not been brought up to date; on p. 147 para. 11 has been reversed, making incontinence characterise fainting and not epileptic fits; and an answer on glycogen omits mention of its storage in the muscles; but, generally speaking, the book is remarkably free from errors, and so pleasantly written that it will be found an attractive aid to study.

The Relation Between Labyrinth and Ocular Musculature.

Die Labyrinthreflexe auf die Augenmuskeln nach einseitiger Labyrinthextirpation. By Dr. R. Lorente de Nó, Assistant in the Cajal Institute, Madrid. With 186 figures in the text and 22 plates. Berlin and Vienna: Urban and Schwarzenberg. 1928. Pp. 205. M.15.

The work performed for Dr. Lorente de Nó's monograph has been conceived and carried out on a high level of scientific knowledge and skill. The book gives the reader an insight into the technical and other difficulties and complexities surrounding the investigation of the relation between labyrinth and ocular musculature, and is far from easy reading. Probably it is well that this should be so; Dr. de Nó is at pains to point out that in regard to the actual anatomical connexions of central labyrinthine structures ignorance is not by any means dispelled, and if this is true of morphology it is truer still of physiology. His book deals only with one aspect of labyrinthine function, yet it is based on uninterrupted researches during a number of years. The major portion is taken up with protocols of a large number of personal experiments, mainly on guinea-pigs, in which the labyrinth has been extirpated and ocular movements studied by a special technique. The author gives us a highly technical discussion of his own conclusions and of those of others, which is of interest mainly to the specialist, and which, moreover, embodies abstruse mathematical data with which few can be familiar. Incidentally, he is critical of certain findings as to the causation of decerebrate rigidity, and claims that his experiments are not in harmony with the teaching of Rademaker and others of the Magnus school. The monograph does not lend itself readily to summarisation, in view of its peculiarly technical character. Possibly its chief problem is that concerned with the quick phase of nystagmus; the author's experiments lead to the view that for the occurrence of this phenomenon the substantia reticularis of the pons must be intact and that its neurones must be in relation with the central nuclei of the labyrinthine system. He considers that both quick and slow components result from peripheral labyrinthine excitations, not, however, corresponding to separate end-organs; on the contrary, his opinion is that a peripheral stimulus starts a diphasic reflex from a given semicircular canal, comparable to the awakening of the scratch-reflex in the spinal animal by a single cutaneous impression.

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The book, then, is a medley of the author's teaching on those points of gynæcology and obstetrics—chiefly the latter—which he considers of clinical moment and on which he feels he has something to impart. Orderly arrangement is entirely absent. Part I. begins with gynæcological examination and diagnosis, and a chat on displacements follows; a diversion then occurs to pelvimetry and obstetrical diagnosis, and post-partum examination, after which we are switched back to gynæcological conditions considered on a pathological basis. Part II. is almost wholly obstetrical, the subjects apparently being taken in the order of their prominence in the maternal mortality list. It begins with sepsis, toxæmia of pregnancy, and hæmorrhage, after which follow obstetric operations, malpresentations, repair of birth injuries, post-partum care, and alleviation of pain in labour.

Much of the matter is excellent and the work throughout is eminently clinical and practical; the modification of treatment to meet the particular patient is emphasised. The book will interest and instruct those who are in the mood to browse here and there as their inclination may direct.

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In the first section are described the various ways in which staphylococci can gain access to the skin; the frequency with which *S. aureus* is recovered on culture; the peculiar type of perifollicular abscess, the furuncle, and its necrotic sequela; Bockhardt's impetigo (which is not a streptococcal infection), and the consecutive alopecia sometimes noted in hairy regions. In the second chapter of this section the various forms of sycosis, nail infections and granuloma pyogenicum, due to *S. aureus*, are considered with a scrupulous regard for accuracy.

Section 2 is devoted to the streptococci. Impetigo is discussed in detail; intertrigo and its eczematous complications are then described, and eczema is considered from the bacterial aspect. It is admitted that the universality of the cocci and their low-grade specificity render all conclusions based on bacteriological findings vague and uncertain. The ætiology and nosological relationships of "eczema" are further elaborated in section 3. Some of the terms used, for example "eczematides," "coccides," introduce a finesse of diagnosis which makes a special appeal to the dermatologist, but which nevertheless has a practical bearing referred to later in the section on treatment. The study of this complex elaboration is much assisted by the photographs of actual cases, many of which recall the multiplicity of clinical types in which the author is striving to create some semblance of order, a task for which his famous treatise on the ringworm fungi has especially fitted him. The final section is a therapeutic synopsis of methods and formulæ of the old and well-tried French school. The lucid table of contents and a complete international bibliography are additional features in a most admirable production.

THE ULTRA-VIOLET RAYS.

Their Action on Internal Diseases and Use in Preventing Loss of Colour and Falling of the Hair. By ARNOLD LORAND, M.D. Vienna, Physician at the Carlsbad Springs, Czecho-Slovakia. Philadelphia: F. A. Davis Company. 1928. Pp. 258. $2.50.

THE title of the volume leads one to expect a study of the action of ultra-violet light on digestive, nervous, and ductless gland diseases. This has not been supplied; no effort has been made to study the action of light, apart from the many other methods of treatment employed, and no series of comparative cases is given. The statement is made here and there that better results were obtained when light treatment was superimposed on other methods, including gland extracts, iodine, mud-packs, and mineral spring water cures. The dosage employed is seldom stated in precise terms and the degree of erythema aimed at is not always given. The author attributes the reddening of the skin in strong sunlight to an irritation of the blood-vessels of the skin, and says that for this to occur the sympathetic (splanchnic) must positively be involved (p. 27). The book contains innumerable dogmatic statements for which no scientific proof is adduced. Dr. Lorand advocates light treatment as a means of lessening pain—e.g., by irradiation of the gall-bladder area in cases of gall-stones—and claims that the symptoms of old age are alleviated by the use of the mercury-vapour lamp; here, again, he does not limit treatment to ultra-violet light, but gives extracts of ductless glands and iodine as well (p. 95). The use of ultra-violet light for cosmetic purposes will hardly recommend itself to actinotherapists. The author states that after desquamation has occurred the complexion improves and that wrinkles disappear. It must be remembered, however, that mercury-vapour reactions are, as a rule, very painful, that turgescence of the skin is mostly transitory, and that this treatment may stimulate hair-growth in any irradiated part, not on the scalp only. The author's claim that light treatment is efficient in reducing obesity and in lowering blood pressure (apart from a small temporary fall) is not upheld by other investigators in this field; but since he uses light mainly as an auxiliary treatment, he is not really in a position to make specific claims for its efficacy. Several chapters are devoted to the subject of the action of light in stimulating hair-growth and to the treatment of greying hair, the work of Nagelschmidt in this field being duly acknowledged.

We have nothing but praise for the way in which the book is published; the clear type, the good binding, and light weight, are an achievement at the moderate cost of $2.50.

SPINAL NEURO-SYPHILIS.

La Syphilis Médullaire. By Dr. LORTAT-JACOB, Physician to the Saint-Louis Hospital, Paris; and Dr. POUMEAU-DELILLE, Interne of the Paris Hospitals. Paris: Masson et Cie. 1928. Pp. 151. Fr.70.

THIS volume belongs to the series entitled *Collection Médecine et Chirurgie Pratiques*, and contains in a concise form, for student and practitioner, present-day information on the varieties of spinal neuro-syphilis, their pathology, semiology, differential diagnosis, and treatment. Tabes dorsalis is excluded, for no very obvious reason; combinations of tabes with amyotrophy, with lateral column involvement, with incomplete transverse "myelitis" are not so infrequent as to suggest a fundamentally differing ætiology for parenchymatous as compared with interstitial manifestations, but the authors describe only the meningovascular types under the chosen title. A good account is given of acute and chronic meningomyelitis, gummatous forms, syphilitic muscular atrophy, and of rarer groups such as syphilitic combined sclerosis, and spinal compression of syphilitic origin. A place is found for "pseudo-tabes syphilitique" and "pseudo-sclérose en plaques syphilitique," although in our view these terms are misleading and should be abandoned. Neither of them should be characterised with the epithet "pseudo," for the former is merely a tabetic variety with overflow from the posterior funiculi, while the latter is a multiple, disseminated, syphilitic "myelitis." On the other hand, attention might have been drawn—since rarities are included—to the interesting combination of systematised posterolateral sclerosis with amyotrophy.

The purpose of the authors, however, is well served by this little vade-mecum.

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6 years, suffering from severe faucial and laryngeal diphtheria, who developed subcutaneous emphysema of the neck, face, and chest. Considerable relief followed tracheotomy, and recovery ultimately took place, though the emphysema lasted for 11 days. Rolleston could find only six other examples, a record of emphysema in laryngeal diphtheria apart from tracheotomy or intubation. The condition is probably due to the fact that, as the result of dyspnœa, pulmonary emphysema occurs, vesicles on the surface of the lung rupture, and air passes to the root of the lung and so to the mediastinum and neck.—Dr. Helen Mackay records a case of diabetic coma with subcutaneous emphysema in a boy aged 4 years. The emphysema appeared after about 30 hours' air-hunger and spread over the neck and upper part of the thorax. Recovery took place under insulin treatment.—In a paper on uræmic paralysis following scarlet fever, Dr. M. Shaw, who reports a case of his own, illustrates the rarity of cerebral palsy following scarlet fever by the fact that Rolleston could find only 75 cases on record up to 1927, including four which had come under his own observation. Shaw's case occurred in a boy aged 4 years who, in the fourth week of a mild attack of scarlet fever, developed nephritis followed by symptoms of uræmia and left hemiplegia. The child survived, but the paralysis persisted.—Dr. T. R. Aynsley records two cases of hemiplegia associated with extensive nævus and mental defect, similar to those recently published by Brushfield and Wyatt.—The abstracts from current literature are devoted to acute infectious diseases.

MEDICINE AND THE LAW.

AN UNREGISTERED DENTIST.

THE point in a case which came before the Chichester magistrates on Sept. 11th was whether the extraction of a tooth for a friend by an unregistered man constituted the practice of dentistry. Suffering great pain from toothache all night, a man named Pace went to his friend, Lewis Llewellyn, in the early hours of the morning on July 29th. Knowing that all the dentists were closed at that time of the day, Llewellyn extracted a tooth, and in endeavouring to extract another the tooth broke. Llewellyn was not in possession of the correct instruments, and he advised Pace to go to the hospital. From there he was sent to a qualified and registered dentist, and the remains of the broken tooth were extracted. The Dental Board of the United Kingdom took the case up, and Llewellyn was summoned for practising dentistry without being registered under the Dentists Act. Up to 1921 Llewellyn had been engaged in dental practice on his own account in Swindon. He did not register as a dentist when the Act of 1921 became operative, as he was then under 23 years of age; and he told the court that since the Act he had extracted only one tooth—that of Mr. Pace. The magistrates found that a technical offence had been committed, but they recognised that Pace went to his friend in great pain, and Llewellyn made no attempt to evade the law, but simply tried to help his friend. Furthermore, Llewellyn, when he found he could not do all he wanted to do, sent his friend to a dentist. The magistrates dismissed the case, ordering each side to pay its own costs. The mayor cautioned Llewellyn, telling him to be wiser in the future in regard to such matters. At the outset of the case a request was made that the mayor, Dr. A. H. Bostock, the presiding magistrate, should not sit on the bench, as the Act of 1921 was passed largely through the instrumentality of the medical profession, but after consultation Dr. Bostock intimated that it was the opinion of his colleagues on the bench that it would be quite fair for him to remain there.

CORONER AND JURY'S COURAGE.

The newly appointed coroner for East Sussex, Dr. E. F. Hoare, had something to say at an inquest at Chailey on Sept. 18th on the habit of juries coupling with their verdict of suicide the words, "while of unsound mind." In this case the inquest was on a man aged 43. The widow stated that her husband had often threatened suicide and worried a good deal when he was out of work. About a month ago she found a tin of rat poison in his bag, and fearing that he might use this poison on himself she asked a nephew to bury it in the garden and this was done. The man bought an ounce of prussic acid and signed the poison book, saying that he required the acid for killing wasps. Later he was found under a hedge on his allotment, the cause of death being cyanide poisoning. At autopsy the condition of his viscera appeared to be perfectly healthy, and there was nothing in the state of the body to suggest a motive for the act. Summing up, Dr. Hoare made the following comment: "The point is, is there anyone who saw the man take the prussic acid? I was present at the post-mortem examination and the body was full of cyanide poisoning. The fact that it was found on his body and in his stomach points to the fact that he took it himself. The other question to consider is in regard to the state of his mind at the time. This is not very clear. His wife states that he had talked about committing suicide and thought he was likely to do it. Before you return your verdict I would like you to realise that the mere fact that a person commits suicide does not mean you have got to say he was of unsound mind. Juries are rather apt to do that. You must be convinced there is some evidence of unsound mental balance before the act was actually committed." After a short consideration the jury announced a unanimous verdict of "Suicide" only, to which the coroner replied: "I think you are perfectly right. One must have evidence of definite mental trouble before insanity is mentioned. I am very glad you had the courage to stick to your verdict. Unless you have evidence you must not assume. I congratulate you on the courage you have shown."

DANGEROUS DRUGS ACTS: A DOCTOR PROSECUTED.

It is a legal maxim that nobody is allowed to excuse himself by pleading ignorance of the law. In certain cases, indeed, the courts may expect special knowledge of the law. For instance, a medical practitioner would presumably be expected to know more about the Dangerous Drugs Acts and Regulations than a shoemaker or a plumber. At a recent prosecution at the Tower Bridge Police-court (on a charge of having failed to enter in a register the particulars of the purchase of certain quantities of morphine sulphate on certain dates) it was somewhat unfortunately urged on behalf of the defendant doctor that the practice of the medical profession was extremely lax in these matters, and that the defendant did not realise what the regulations implied. This kind of plea, which the magistrate entirely declined to accept, does no service to the medical profession as a whole, since existing arrangements for the enforcement of the law are based upon the loyal coöperation of the members of that profession. Nor did it assist the particular defendant since, at a later stage of the proceedings, statements were made by the prosecution which appear to have established something more than mere laxness. A representative of the Director of Public Prosecutions informed the court that the defendant had been convicted earlier this year as a drug addict. A detective-inspector mentioned a previous charge in April last of stealing 100 tablets of morphine sulphate. It was stated that last June the defendant was sent to a home until he could be certified as cured, and that he had been released under the Probation of Offenders Act. Fortunately the magistrate found a lenient course possible. On the defendant's partner undertaking to look after him, the defendant was remanded for three months on his own and one other surety in £50 each. This should mean that, if there is no further infringement of the law, there will be no further punishment.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 29, 1928.

RHEUMATIC HEART DISEASE IN CHILDHOOD.

RHEUMATIC carditis is now recognised as a crippling and fatal disease, of which the complete cure is so rarely achieved that efforts are being centred chiefly on its prevention. In his Lettsomian lectures, the last of which we publish to-day, Dr. F. J. POYNTON makes a weighty contribution to this campaign. He has much to say that will encourage all who are working at the rheumatic problems of childhood, but at the same time he leaves a sobering impression that though the subject has been intensively studied for many years, the gaps in our knowledge are still so wide and formidable as to hinder forward progress. As regards the predisposing causes of the disease, he believes strongly in a hereditary factor and in a nervous element, but also that there may be other causes, endocrinological and dietetic, which have not yet been sufficiently explored. His attitude towards tonsillectomy is hesitant rather than sceptical. "It seems clear," he says, "that the tonsils must destroy infection, but the difficulty is to ascertain when they cease to act as a protection and become a danger." Evidence upon the occurrence of first attacks of rheumatism in children who have already had the tonsils enucleated is being accumulated on a large scale, and its publication is anxiously awaited by Dr. POYNTON, since the standardisation of current practice must depend on the frequency with which such attacks occur. The influence of damp is less to be feared, in Dr. POYNTON'S experience, than that of sudden atmospheric change; in large towns dry weather is held to predispose to dust-formation and sore-throats, and so to rheumatic infection. Dr. POYNTON deprecates the exhibition of salicylate of soda in large doses to frail rheumatic children; in his hands, tolysin, a cinchonic acid preparation, has proved an important addition to the scanty number of drugs which influence the rheumatic infection and is not toxic. The results of "sanatorium" treatment given in the home for heart cases in Sussex, recently transferred to West Wickham, are encouraging. The late effects of prolonged convalescence in this home correspond with those published recently by the Ministry of Health [1]—about two-thirds of the cases investigated after return to their homes were found to have maintained the improvement in their condition.

One of the most difficult problems for the clinician is to know when an attack of rheumatic carditis is over, that is, when the healing of the necrotic areas in the connective tissue of the myocardium is complete. Since it is extremely rare for death to take place during the earliest phases of the illness, pathological material for the study of this problem in prognosis is scanty. One has only to imagine the picture of early tissue-necrosis and attempted healing going on side by side, as caseation and fibrosis go on side by side in the tuberculous lung, to realise the difficulty of estimating the stage of the disease in the living subject. Add to this the uncertainty as to the method of primary invasion of the body by the infective agent, and the outcome is that we know depressingly little about the pathology of the condition. Dr. POYNTON tells us that 25 years ago Dr. ALEXANDER PAINE, his co-worker, and himself prophesied that the great battle of causation would be fought not over acute rheumatism but over malignant endocarditis, and he still holds that malignant endocarditis will prove the key to the situation. In this affection there can only be the two alternatives, either the rheumatic infective agent develops a great virulence and overwhelms the defences, or it has prepared the way for other infections. Dr. POYNTON, holding as he does that a streptococcus is the cause of acute rheumatism, naturally sponsors the former view, and, arguing from actual cases where micrococci have been obtained from patients with rheumatic carditis, states that the important question for the future treatment of heart disease is whether or not there is a malignant type of rheumatic endocarditis. If there is, the cause of acute rheumatism is known at once, but if not, how, he asks, are we to explain the frequent association of streptococci with rheumatic lesions? Against the theory of a secondary infection he claims that though the septic infections of childhood, such as tonsillitis and otitis, should give ample opportunity for attack on damaged valves, yet malignant endocarditis is exceptional in the child. Incidentally he notes that after attempts over a period of 20 years to treat rheumatic heart disease by vaccines or sera he has never succeeded in obtaining results good enough to justify any clear statement, and in malignant endocarditis his experience of vaccines has been "one uniform record of complete failure in both child and adult, used early or late, in combination with sera or separately, autogenous or stock, simple or complex."

Dr. POYNTON considers the pathological lesion in mitral stenosis to be of a different type from the ordinary rheumatic tissue-necrosis and tissue-repair, in that the process of fibrosis is slower and more subacute. Since this lesion is by far the most serious valvular lesion resulting from cardiac rheumatism, by reason of the actual obstruction it presents to the circulation and also of its close association with auricular fibrillation in later life, it is satisfactory to find the process of its evolution considered as a separate subject. If the development of mitral stenosis in the young could be by any means prevented, the late results of rheumatic disease would be less terrifying. Dr. POYNTON emphasises the significance of dilatation as the earliest sign of cardiac disease, and like the late Dr. D. B. LEES, the importance of the light form of percussion. He values electro-cardiographic methods and considers that disturbances in rhythm are probably the result of focal lesions in the connective tissue framework of the heart in the region of the bundle of His. This attitude is in direct opposition to the views of the late Sir J. MACKENZIE on the youthful types of irregularity, extrasystole, and sinus arrhythmia. The presence of sinus arrhythmia, according to Dr. POYNTON'S school, does not signify that the heart has escaped infection. This is fortunate if there is any truth in the view held by some that a return of the respiratory variation in the heart-rate signifies a quiescence of cardiac infection in the rheumatic heart.

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[1] Reports on Public Health and Medical Subjects No. 44.

MODERN PROBLEMS IN NEUROLOGY.

English neurologists are little given to the writing of systematic books, but on rare occasions we are able to welcome collections of papers by them issued in book form. To Dr. S. A. Kinnier Wilson we are now indebted for a group of selected contributions on the neurological problems which have particularly engaged his attention in the last few years. The first third of the book[1] is devoted to the problem of epilepsy—or "The Epilepsies," as Dr. Wilson prefers to say; the second to the problem with which the writer's name is particularly associated, that of the diseases of the corpus striatum; and among the remaining chapters we find one devoted to a third great problem, the nature of certain disorders of sensation. The problems of epilepsy, using the word in its widest sense, have of late years been engaging the concentrated attention of English specialists, and their activity has frequently been reflected in our own columns; among their more noteworthy contributions Dr. James Collier's recent Lumleian lectures[2] and Dr. Gordon Holmes's Savill Memorial oration[3] rise to our minds. The English school of neurology has behind it the greatest contribution ever made to the knowledge of this subject, Hughlings Jackson's discoveries and teaching in regard to the forms of attack which have since borne his name, and Dr. Wilson reverts frequently to Hughlings Jackson as to the fons et origo of all modern knowledge in this department. In the articles now reprinted his own analytical mind has concerned itself chiefly with the most basal problems of the subject—what constitutes a fit? the type of movement in a general fit, the numerous variants of epileptic attacks, the inhibitory elements which form part of every attack and seem to form the whole of certain attacks, and the essential unity with epilepsy of the peculiar symptom called narcolepsy.

Of the chapters referring to diseases of the corpus striatum the keynote is restraint. Since Dr. Wilson gave the original description of the syndrome of the corpus striatum in 1912 there has been a widespread tendency to add to the syndrome and very varied disturbances of movement and of speech and writing have been attributed to disorders of one or other part of the basal ganglia. But these ganglia are of simple structure and therefore most unlikely to have multiplex functions. Critical judgment and experimental methods applied to some of these symptoms show that it is unjustifiable to ascribe them to striatal dysfunction, and the narrow limits which Dr. Wilson still sets to the functions of the corpus striatum will, we imagine, surprise many of his colleagues abroad. "The main features of disease of the corpus striatum consist of disorder of muscle-tone regulation, and appearance of involuntary movements." "Disease of the strio-spinal system . . . allows rigidity and hyperkinesis." The author, who speaks with authority in this department, sees no reason to add to these.

The third great problem in neurology which this stimulating book raises is that of the nature of certain subjective sensory disorders associated with organic lesions. In the chapter entitled "Dysæsthesiæ and their Neural Correlates" (the title smells of brimstone and the black art!) the philosopher in the neurologist is at his best. "Dysæsthesiæ" includes all subjective disorders of sensation, such as "burning," "tingling," "deadness," which seem to arise spontaneously. After a brief preliminary discussion, including a short consideration of the nature of pain, the dysæsthesiæ associated with lesions at the various neural levels are described. Since these abnormalities are conscious sensations the afferent paths from the sites of the lesions to the "perceiving cortex" must be open, and the latter must be intact. Their pathogenesis may be attributed either to stimulation and excitation at the site of the lesion—in many ways the simplest theory, or to the withdrawal of the influence of a postulated inhibitory sensory system—a view which presents many theoretical difficulties as yet, but to which further evidence may bring more support. Another pathogenic factor may be lesions either of the sympathetic nervous system or of the vascular system. Cases of peri-arterial sympathectomy furnish evidence pointing to the modification of certain sensory disorders by operation on arterial nerve-plexuses. Thus under certain circumstances a neural origin, under others a vascular or sympathico-vascular origin underlies the manifestation of dysæsthesiæ in consciousness.

The presentation of these papers in permanent and accessible form is the more fitting inasmuch as the writer possesses, in a degree uncommon among medical authors of our time, a gift for putting his contributions into literary shape.

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[1] Modern Problems in Neurology. London: Edward Arnold and Co. Pp. 364, with 56 illustrations. 21s.

[2] The Lancet, 1928, i., 587, 642, 687. [3] Ibid., 1927, i., 957.

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THE COMMON COLD.

Everyone has had, is having, or shortly will have a common cold, and, if we follow the advice of Prof. Lovatt Evans given at the recent meeting of the British Association, we shall not seek to know why it is so—that, he says, is the province of the philosopher; what we want is a brief statement of the way of a cold, and this, in spite of almost universal personal experience, is what we lack. The natural history of diseases which strike occasionally and disappear for a time has in many cases been worked out with care. The common cold is so swift and prolific that, like the drosophila for problems in genetics, it might well serve as the type object of epidemiological research. The new conception of epidemic genesis recently set out by Dr. C. A. Gill, director of public health for the Punjab, in a book reviewed on another page, may stimulate inquiry into the way of a cold, for the gist of what he calls the quantum theory is that all epidemic manifestations are essentially dependent upon loss of equilibrium between infection and immunity—upon what Lovatt Evans would call maladaptation. And Gill's theory is all the more applicable to the common cold, for he attributes great prominence in the genesis of epidemics to meteorological conditions. During their passage from one human host to another, he writes, parasites are exposed directly or indirectly to the influence of meteorological conditions, a factor which may well be potent, even though the host as well as the parasite is susceptible to atmospheric changes. We are, as it happens, in possession of some recent information as to the extent to which disturbance of the body heat may be considered as the primary cause of commensal infection. The inquiry is by Dr. J. J. van Loghem, professor of hygiene in the University of Amsterdam, who has made a special study[1] of the borderline between parasitism and commensalism, the commensal organism being one that lives on the surface of the skin and mucous membranes and only causes disease under special circumstances which weaken the physiological defences. There are previous data bearing on the point. Greenwood and Young in this country have found temperature to be the meteorological factor most closely associated with the mortality from respiratory disease. Dr. van Loghem also quotes an analogous result from a study by Schade of the German Army in time of peace which showed a parallelism in the rise and fall of "disease through cold" (affections of the skin in consequence of freezing), and of respiratory diseases. The direct research into the minor respiratory diseases conducted by the Public Health Service of the United States has also shown the synchronous occurrence of these diseases in various parts of North America.

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[1] Journal of Hygiene, vol. xxviii., No. 1.

Dr. van Loghem's own research in Holland lasted 37 weeks and the final data covered 6933 persons. His informants were mainly heads of families of the more intellectual classes. A weekly list of questions demanded for each member of the family simply a no (no new cold) or yes (caught cold), and in case of colds the further statement—nose cold, sore-throat (angina), hoarseness (laryngitis), cold with cough (bronchitis), or slight influenza. No inquiry was made about serious diseases. The weekly percentages of colds in seven geographical groups showed a roughly similar course as regards major variations, and this similarity became more evident when the data were put into two groups only—Amsterdam and the rest of Holland. Roughly the same course (with the exception of a high initial September peak in the colds) was found in the ten-daily average of the outdoor temperature, inverted so that the peaks were peaks of cold. This disparity the author explains by the fact that the nights were then very cold—a fact marked in the averages by the warmth of the days, thus indicating that not only a general drop but also a large variation in temperature in the 24 hours may go hand-in-hand with colds. Weekly deaths from pneumonia for the Netherlands also showed a course following roughly—though with a lag—the course of both the temperature and the "colds incidence" line, agreeing with the former more closely than the latter especially in the absence of the high September peak, but differing from both in having a very sharp rise in March and April. Mortality from "old age" in the Netherlands for the same period showed a similar parallelism with outdoor temperature, but unlike pneumonia had no March-April rise. The specific cause underlying this peak in the pneumonia deaths, however, was suggested by a corresponding peak in the influenza deaths for Holland. Of the five types of colds classified in the colds inquiry, coryza largely outweighed all the rest, the courses of coryza and bronchitis were almost exactly parallel, angina and laryngitis showed the same tendency but on a smaller scale. Influenza at first followed the colds and then took its own course, having its highest peak much later in the period, corresponding to the late peak noted in the mortality for the country both from influenza and pneumonia. From these results Dr. van Loghem concludes that during the period there were two important causes of pneumonia—disturbed thermo-regulation, more potent in the first part of the period, and influenza, more potent in the second. He thus places influenza in a different category from diseases resultant on catching cold or commensal infections such as cold, pneumonia (in part), and old age mortality, and describes it as "a parasitic infection which in a period of catching cold easily gets entangled with pneumonia." He concludes that an important part of the respiratory diseases is based on infection by commensal microbes which occurs after the physiological defences have been weakened by a disturbance of thermo-regulation, and that commensal infection may thus lead to parasitic infection to which healthy persons may fall victims by contagion. Dr. van Loghem then sought from his data evidence as to the contagiousness of colds. He argued that if colds were contagious small families should have a lower incidence than large families. On dividing his families into two groups according to size, he found the difference in incidence negligible. This part of his analysis carries less weight, for the average difference in family size is small, and might even with fairly high contagiousness be outweighed by opportunities for infection outside the family. Families even where there are small children are not isolated units, and contact with the outside world is generally too close for us to do more than agree with the author's first comment that nothing has been proved by this of the contagiousness of colds. To test the disturbance of the heat-regulating powers of the body by outside cooling Dr. van Loghem obtained the rectal temperature of 33 children at 3.30 A.M. and 4.30 P.M. for 26 days, and found some conformity between the former and the open-air temperature at midnight—not a very striking correlation if we are right in estimating it from the published graph at 0·19±0·13.

There is room for much more work on the lines of this study. His subjects had an average of over four colds per person in the 37 weeks—a frequency which, as we have said, makes it a hopeful subject for investigation. Such observations might be increased both in scope and in detail. Dr. van Loghem's views on the active and passive means of keeping up the body-heat level may be a little one-sided. The observed facts can tell us of the association of environmental factors such as temperature with the incidence of disease, but assuming a real basis of causation in this association, the manner of its working is not self-evident. The paradox that cold may work inversely by means of heat needs some consideration, and there is nothing in the Netherland results to contradict the conclusion to which the work of Leonard Hill leads, that cold weather may bring about a large crop of colds through people being more inclined to shut themselves up in warm stuffy rooms and to open fewer windows.

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A course will, as usual, be held at St. Mary's Hospital, London, during the week-end preceding the autumn session. The meetings will be in the library of the medical school and will be open to all medical practitioners without fee. They begin on Saturday, Oct. 6th, at 11 A.M., with a lecture by Dr. Reginald Miller on the Intestinal Child, after which Sir William Willcox will speak on Food Poisoning and Paratyphoid Infections (noon). Dr. A. Hope Gosse on Prognosis in Heart Disease (2.15 P.M.), and Mr. R. M. Handfield-Jones on Recent Advances in Everyday Surgery (3.15 P.M.). On Sunday the first lecture will be at 10.15 A.M. when Mr. Aleck Bourne will speak on the New Ovarian Hormones, followed at 11 A.M. by Dr. C. M. Wilson on Some Common Difficulties in Diagnosis, and at noon by Mr. Zachary Cope with a demonstration of clinical cases and pathological specimens. On Sunday afternoon there will be no lectures, but the course will be continued throughout Monday, Oct. 8th, Mr. Duncan Fitzwilliams starting at 11 A.M. with an account of the Use of Radium in Malignant Disease. Prof. C. A. Pannett will lecture, at noon, on Some Surgical Obsessions and Dr. John Ryle at 2.15 P.M. on the Nature and Relief of Some Common Gastric Symptoms. Mr. T. G. Stevens will conclude the series with an address, at 3.15 P.M., on Some Pitfalls in Obstetrics. Those who have attended former courses of this kind will need no recommendation to attend. The popularity of the lectures is a welcome indication of the need felt by practitioners to keep their knowledge up to date.

Annotations.

"Ne quid nimis."

WOMEN IN MEDICINE.

WHILE London University is considering the facilities provided in the London schools of medicine for the education of men and women students respectively, various women's organisations have set up a joint committee to promote equal opportunities for women with men in the medical and hospital services. The latter have now issued a leaflet setting out the facts as seen by them regarding (1) the training of women medical students in London, (2) equal opportunities of hospital appointments, and (3) women on hospital boards of management. It was of course during the war years, 1914–18, that women came into their own in the opportunities for making a medical career. For a time seven of the 12 medical schools of the University of London were co-educational and some of them apparently intended to remain so. This high tide has ebbed as might have been prophesied, and the periodicity of its flow is difficult to determine. There is a perhaps not unnatural tendency to regard the situation as having settled down, like the price of houses and the ratio of unemployment, to what may be regarded as normal conditions. But probably in all three respects it is too early to speak of a norm at all, although the entries of medical students of both sexes are not unlikely to fluctuate fairly close to the standard of 500 each for England and Scotland and 200 for Ireland. The women's memorandum, however, envisages a general tendency towards a steady increase in the demands for the services of medical women as time goes on. First and foremost, there is an increased demand for women to fill posts in child welfare and maternity clinics, school inspection, and the like, under local authorities. There is the probability—the memorandum regards it as a practical certainty—that within a few years national health insurance will be extended to cover dependent wives and children, or, if not, a health service covering these classes will be set up, and in either case there will be greater need for the advice of women doctors. Apart from these special occasions, the memorandum speaks of a steadily growing demand for women doctors spreading from the more to the less educated women as the latter begin to realise the possibility of employing doctors of their own sex. It is suggested that women are still often deterred by scruples of delicacy from submitting themselves to medical examination by a male practitioner until the time has gone by for the recognition of such serious diseases as cancer. The growth of population in and around London, and the increased demand for doctors in India and the Far East, are also regarded as likely to augment women's entry to the medical profession. Finally, there is the economic reason, very frankly stated in the memorandum, that the financial condition of the professional classes at the present time makes it especially desirable for them to seek careers for their daughters; and where should a more suitable career be found than in medicine? These are the reasons why, in the opinion of an influential body of women's organisations, the growing need of facilities for the medical education of women in London should not be overlooked.

OSSIFICATION.

FOR generations the problems of calcification and ossification have been the subject of inquiries and research. Anatomists, embryologists, physiologists, pathologists, and chemists have contributed views on some one or more of the questions concerned, and certain facts have emerged from the theories and fancies to gain general acceptance. It is usually held that calcification precedes ossification, whether cartilaginous preformation is present or not, and that the calcified area is destroyed in the course of the osteogenetic process. Osteoblasts and osteoclasts have also been in the picture for many years, the former being concerned in some way with the deposit of the bony material, while the large, usually multinucleated cells known as osteoclasts are held responsible for the removal of bone where necessary. It must be admitted that the powers claimed for these cellular bodies are not based on incontrovertible evidence, and some observers have not hesitated to deny them. For example, Drs. R. Leriche and A. Policard, who, after some ten years of research in collaboration, have produced their results in a book[1] which does not seem to have attracted the attention it merits, attempt to discredit the osteoblast and belittle the osteoclast. These authors have arrived at many conclusions which are not in accordance with commonly accepted ideas. For example, in discussing the preliminary stages of ossification, they suggest that the physiological value of the connective tissue basis of bone is in inverse ratio to its histological differentiation. The higher the degree of complexity of the pre-osseous framework the less dense is the bone formed. To illustrate this thesis, bone is aptly compared with reinforced concrete, the steel skeleton representing the connective tissue fibrils, while the cement corresponds to the calcified matter. They believe that there is no relation between osteogenesis and the presence of osteoblasts, which are held to be osteolytic elements, albeit of a feeble power. Their appearance is held to be a reaction on the part of the cellular elements to the pre-osseous changes occurring in their midst. The osteoclast is not, according to these workers, a cell of specific origin; it may arise from fibroblasts, osteoblasts, or endothelial cells. Its action is phagocytic; osteoclasts have been observed in the process of enclosing fine spicules of bone in areas where absorption is taking place. The view expressed by Kölliker that osteoclasts may change into osteoblasts finds no favour; disintegration and disappearance of these elements seems to Leriche and Policard to be a more likely fate. The resorption of bone is not, according to these observations, a cellular phenomenon, and the rôle of the osteoclast may be of minor significance. The process of halisteresis is considered from a biochemical aspect. As to the periosteum, Leriche and Policard range themselves with Macewen in holding that it does not possess any specific osteogenic function. It limits bone growth, but also by virtue of its proximity to the bone-forming elements it favours ossification. The authors describe an ingenious method of experimental production of bone in the skin in man, and discuss the mode of formation of bone in unusual regions. Finally, an attempt to apply to pathology and surgery the general laws of ossification is stimulating and suggestive. Nevertheless the work is not altogether convincing. Especially in regard to the osteoblasts and osteoclasts it is difficult to accept their conclusions. Most embryologists will hold that the status of osteoblasts and osteoclasts remains more or less unimpaired. The older view of the preliminary calcification, that it was a deposit of lime salts in a non-living or extra-cellular tissue or medium, an inter-cellular substance, has now given way to the better founded conception of the exoplasm, an outlying part of a cell, in which the deposit takes place. It is in this material that fibrils make their appearance before calcification; fibrillation, due probably to the linear arrangement of cytoplasmic granules with a covering of adsorbed colloidal material, is a function of living protoplasm. Calcification, then, occurs during the life of the area involved, but it is nevertheless a sign that this life is at a very low ebb. Ossification, on the other hand, is an indication of exuberant life, a sequence of new circulatory invasion, entailing of necessity the clearing away of the calcified debris which preceded its advent. Embryological examination shows very clearly this association of ossific centres with vascularity, and the way they destroy and replace the practically non-vascular calcified area. These matters were well brought out in THE LANCET of Sept. 8th by Prof. H. A. Harris writing on Bone Formation and the Osteoblast. Readers interested in the questions from a pathological or morphological standpoint will find this paper of considerable reference value. Dr. Harris says truly that we wait for the chemist to explain the colloidal processes which lead to the deposition of calcium in two tissues so fundamentally distinct as dying cartilage and living bone. It does not seem that the anatomist and the embryologist can advance much further without some widening of the horizon. The modern view of living substance compares it with a reversible colloid, and researches along the lines indicated by such a comparison, researches dealing with suspensions and emulsions and the effects on them of various salts, will without doubt open up new avenues along which the investigator of ossification will be able to progress. There will still remain a vital activity (in the form of cellular regulating processes) which will be outside the chemist's province, and it is in the elucidation of this process that the opportunity of the experimental embryologist will come.

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[1] Les Problèmes de la physiologie normale et pathologique de l'os. Paris: Masson et Cie.

CHILD WELFARE IN JAPAN.

WRITING from the laboratory of the University medical clinic at Kyoto, Dr. Teruko Minouchi describes[1] the development of infant and child welfare in Japan. She points out that the changes which have taken place in this country within the last 60 years, while they represent an enormous advance in energy and culture, seriously threaten the health of the people in several directions. A special feature in the industrial life of Japan is the greatly increased ratio of female to male workers, especially in the case of the textile trades which form the most important industry of the country. The ill-health of the women is increased by the fact that the girls begin to work while very young and undeveloped. The author briefly sketches the growth of infant welfare in Japan from its earliest beginning 1400 years ago down to the present day. In spite of this long period, however, the infant death-rate in Japan in 1924 was more than twice that of England and Wales, and three times that of the Netherlands. Dr. Minouchi is convinced that progress in maternity and child welfare will depend largely upon the development of the women's movement, and she urges that women should take a larger share in public life and in the general activity of the nation if any progress is to be made in social hygiene. Dr. Minouchi's paper was presented to the open meeting of the Medical Women's International Association recently held at Bologna.

CONTROL OF INVALIDITY.

NATIONAL attention is being ever more and more directed to the importance of invalidity, to the economic loss it entails through national insurance, and to the industrial inefficiency thereby created. Few investigations have thrown more light on the causes underlying sickness, whether due to illness or accident, than one made among coal-miners by Dr. H. M. Vernon and Dr. T. Bedford.[2] Nevertheless, the subject is difficult; and, although records were studied relating to 23,000 miners for periods of 21 months to six years, and although the authors can point to the extraordinary sensitiveness of the miner to his conditions of work and general environment, yet the inferences suggested by the facts are only cautiously advanced. Some deductions seem definite. The most valuable method of reducing absenteeism which among coal-miners is considerable is to improve the conditions of work; thus air movement within a narrow range is associated with a minimum of accidents and sickness, and at moderate variations to lower or higher velocities the rates rapidly rose. Air velocities of only 18 to 21 feet per minute were found, and are condemned as too low for efficient work or for safety in mines rich in gas. The cause of absenteeism most studied was accident, the frequency of which, so far as minor accidents are concerned, varies with underground temperature. The grading is remarkable; accidents causing less than ten days' disablement were 4·3 times more numerous at the highest than at the lowest temperatures; those causing 10–19 days' disablement were 2·0 times more numerous; those causing 20–59 days' disablement were 1·5 more numerous; but major accidents causing 60 days or more disablement were unaffected by temperature. Generally what holds good for accident frequency also holds good for sickness rates. Undue exercise increased absenteeism; men who walked from the pit shaft to the coal face, 2800 yards, showed 58 per cent. more than men who walked 1330 yards; similarly, men who lived 2–6 miles from their colliery showed 80 per cent. more voluntary absenteeism than those living 1–2 miles away. Seasonal fluctuations naturally affected surface workers more than underground men. The outstanding conclusion to be drawn is the delicate way in which the human organism reacts to its environment; by controlling the environment its reactions can be advantageously controlled whether the reaction result in a traumatic or infectious " accident."

THE CEREBRO-SPINAL FLUID IN SYPHILIS.

WRITING on the cytology of the cerebro-spinal fluid in syphilis, Paul Ravaut and Raoul Boulin[1] say that dried fixed films made after centrifugation leave such a large proportion of the cells disorganised as to be valueless, whilst a simple numerical count may give no hint of a serious underlying pathological process, persisting after the cell count has almost reached normal figures. After many trials they favour vital staining with methyl-green pyronine, the deposit after centrifugation being mixed with the stain and the cover-slip ringed. Such a preparation lasts about 24 hours. Living cells may be distinguished by the fact that they take longer to stain, sometimes even hours, the nucleus eventually becoming blue and the cytoplasm and nucleolus red or rose-coloured. As a result it is claimed that the following types of cell may be distinguished: unattached nuclei, lymphocytes, medium-sized mononuclears, polymorphonuclears, large mononuclears, and plasma cells. The two last types are always of great importance as indicating involvement of the parenchyma of the nervous system, as opposed to meningitis. In secondary syphilis, a count composed of lymphocytes and medium-sized mononuclears gives a favourable prognosis under treatment; but if large mononuclear cells and plasma cells are also present, they may persist in spite of treatment, giving warning, perhaps years ahead, of involvement of the nervous system. Tertiary cases they divide into four groups: those with no clinical involvement of the nervous system, those in which only the cerebral vessels are affected, tabetics and cases of general paralysis. In the first two groups the same rules apply as in secondary syphilis, but the significance of an abnormal fluid is greater. In an early tabes lymphocytes and middle-sized mononuclears often predominate with perhaps a few small plasma cells, or the latter may form the majority. An old or arrested case may show very few cells, most of them dead, and polymorphonuclears are rare. It is often impossible to tell a progressive from an arrested case by the cells present because, though quiescent in the meninges, the disease may be active in the parenchyma.

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[1] Die medizinischen Massnahmen zur Gesundheitsfürsorge für Kinder, insbesondere Säugling und Kleinkind, und für Jugendliche in Japan.

[2] A Study of Absenteeism in a Group of Ten Collieries. By H. M. Vernon and T. Bedford. Industrial Fatigue Research Board. Ref. No. 51. H.M. Stationery Office. 2s. 8*d*.

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[1] Presse Méd., July 14th. This paper summarises one appearing in the Annales de Dermatologie et Syphilographie for last December.

General paralysis has more definite characteristics. The cells often show great vitality and diversity of type and it is only in these cases that the large and polynuclear plasma cells are found. Lymphocytes and medium-sized mononuclears still, however, often form the majority of the cells present. Ravaut and Boulin claim that the technique is simple, but it is clear that a considerable experience would be necessary before the different types of cells could be distinguished with certainty, the more so as moist preparations are necessary. Confirmation of the results is also clearly necessary and this can only be obtained, as the authors have found, by years of comparison with clinical findings. But the importance of the spinal fluid as a guide to prognosis in secondary syphilis is now becoming recognised; and the assistance promised by the present work should not be ignored where there is enough material at hand to allow mastery of the technical difficulties.

QUESTIONING THE PATIENT.

No one will dispute the importance of thorough physical examination before diagnosis, but the stress laid upon it tends to relegate history-taking to a second place. The main reasons for a relative neglect of this fundamental part of the examination are nervousness or incoherence on the part of the patient, a preconceived idea of the diagnosis either on his or the doctor's part, and, most important of all, lack of time. The time available for a consultation has its limits, and it can only be used to the best advantage if patient and physician are prepared to assist each other. We have just received the second edition of a little book[1] designed to meet these difficulties and prepare the patient for consultation. It opens with a short preface in which the duties of the patient to the physician are explained, and emphasises especially the need for early consultation, so that tendencies to disease may be recognised before they become incurable, and the desirability of giving an accurate account of the symptoms themselves rather than of deductions and theories. This advice is followed by lists of questions arranged under various headings such as general information, family history, nutritional and digestive disorders, and respiratory troubles, which the patient, according to his complaint, can prepare himself to answer, in order that when the actual consultation arrives nothing will be missed and answers will be clear and to the point. There is no doubt that if this book were used intelligently history-taking would be made easier and more speedy. But there are great disadvantages in putting a book of this kind in the hands of patients. The people who most need such a guide are exactly those who would be most confused by the possibility of having to answer a formidable array of questions, whilst the suggestive effect of studying queries like, "Have you a very sharp pain which starts from the region of the heart and goes towards the left arm?" might be very unfortunate. The book may be useful to the physician in re-emphasising the value of a careful history, but in the hands of patients it would certainly give rise to more mistakes than are traceable to the surreptitious leading questions which a medical man must introduce into his catechism.

MALARIA AND COMPROMISE.

The 33 members attending a session of the First Subcommission of the Malaria Commission of the League of Nations have issued a unanimous report on antimalaria methods.[2] The final aim of all measures directed towards the eradication of malaria is regarded as being an "integral bonification," which may perhaps be defined as the sum of economic, social, and hygienic betterment induced by development of the land and growth of civilisation. But by the very process of its attainment, bonification may temporarily increase malaria, so that in the meantime antilarval and other measures must be employed. Time is the essence of the contract for this as for all general antimalarial procedures, and unless adequate time be conceded adequate results will not be obtained. Time, too, is concerned in obtaining that "minimum effective degree of perfection" which must be reached before any individual antimalarial measure produces visible results. The most important of these is the treatment of the sick; it is the primary obligation, whose good results will, however, be apparent rather in the reduction of the severity of infection than of its incidence. In the choice of other intermediate methods which shall be employed in any particular local campaign, imitation of those which have already proved their value elsewhere is actually dangerous. Quite otherwise is the imitation of the confidence, energy, and perseverance which gave them their earlier success, and of the discernment which chose those measures which have proved applicable to each particular locality. In effect, this advice from the Subcommission implies the selection of an executive officer with wide knowledge and shrewd mind, who is allowed time in which his schemes may show their value. The report also emphasises how essential is the setting apart, in every country concerned, of special research workers; for very much still remains obscure in malaria, and antimalarial measures cannot reach their full effect till that shadow is enlightened.

HOUSING IN CITIES.

During the coming autumn session Parliament will have to review the position of the subsidy granted out of the national exchequer in order to expedite the supply of adequate housing for the existing population. The Minister of Health, who has the Rating and Local Government Bill on his hands, will no doubt be guided mainly by the experience of the public health authorities in the large urban areas concerned. Reports from medical officers of health of three industrial cities contain comments of moment on the local housing problems.

In Birmingham the City Corporation has since 1920 built 17,682 houses, the numbers for the years 1925–6–7 being 3066, 5159, and 4007 respectively. Dr. H. P. Newsholme remarks that while this steady progress is being made in the provision of new houses, the problem of housing continues to rank as one of the most urgent and fundamental questions confronting the city. Much is being done, through sanitary inspectors and in other ways, to improve the conditions, often deplorable, of the least satisfactory houses, but there is great need for more radical treatment of a large mass of mean houses spread through various portions of the city—houses which are dismal, dilapidated, insanitary, and lacking in elementary amenities. It is not possible, says Dr. Newsholme, to measure the loss to Birmingham arising from the effects of such surroundings, not only through their adverse effect on physical welfare, but far more fundamentally through their hindrance to any real fullness of life. The problem calls all the more strongly for a solution through the contrast between this old and insanitary property and the remarkable new housing estates which have sprung up so rapidly. It is to be hoped on the one hand that the proposals of the Government for facilitating slum treatment will mature quickly, and on the other that the rehousing scheme is approaching a stage at which the problem of the slums can be systematically attacked.

In Manchester a special report on housing was submitted by Dr. R. Veitch Clark to the City Council on Sept. 30th, 1927. Dr. Clark can give no real evidence of a reduction in overcrowding although there may be a tendency in that direction, and the increased proportion of cheaper houses in the present housing schemes is likely to hasten the tendency. There is no noticeable slackening in the demand for houses to let, and much the greatest demand is for the A type of house, probably owing to inability to pay higher rents. The report also gives an estimate that about 69 per cent. of the overcrowded families waiting for houses of the A2 and A3 type are able to pay the rents charged by the corporation. An estimate is put forward that the housing need for the relief of present overcrowding and for the normal increase of the population up to Dec. 31st, 1936, is 21,650, and that, in addition, 26,000 houses are required to meet the demolition of those now below a reasonable standard of fitness. During 1927 4461 houses were built, 2240 of which were municipal. Another estimate in the report is to the effect that about one-third of the "lodger overcrowding" is caused by single and married lodgers over 50, who are frequently in receipt of old age pensions or rental allowances from the guardians. The total of these rental allowances is put at £38,000 per annum, and it is suggested that the corporation might provide small houses in the form of flats consisting of a living room and bedroom or of a combined bed-living room for tenants of this type, and thus relieve much of the overcrowding without extra cost to the rates.

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[1] Comment consulter? By Léon Schekter. 2nd edit. Paris: Octave Doin (Gaston Doin et Cie). 1928. Pp. 170. Fr.15.

[2] League of Nations: Health Organisation. C.H./Malaria/121. London: Constable and Co.

In Sheffield, according to Dr. F. E. Wynne, the amount of overcrowding continues to be deplorable and houses unfit for habitation cannot be closed, because the tenants cannot be rehoused. During 1927 five unfit houses were closed and the tenants of three small areas, comprising 173 houses, were removed to one of the housing estates. There are 4000 families on the waiting-list for municipal houses, and only a very small number of the very numerous applications of a most pathetic description received at the office can be entertained. It is impossible to prevent undesirable conditions on the corporation estates arising from subletting. During the municipal year ended March 31st, 1928, 1897 new houses were certified, of which 723 were municipal. During 1925 and 1926 the new houses numbered 2178 and 2714 respectively. The Parliamentary return shows that since the subsidy was reduced in December, 1926, the cost of erecting houses of the parlour and non-parlour type has gone down quarter by quarter, and that for the quarter ended June 30th, 1928, the average reduction in cost for both types was £82. Further, subsidised houses are going up at the rate of 10,000 a month and building is proceeding at twice the pre-war rate. Little has been done as yet in slum clearance and nothing in the way of building houses within the reach of the poorer classes of wage-earners.

These three reports, then, concur in the view that we are now only approaching the most difficult part of the housing problem. All people of goodwill will share the hope that when Parliament tackles it all parties will unite in a whole-hearted effort to cope with a national emergency.

TREATMENT OF MIGRAINE WITH ERGOTAMINE TARTRATE.

THE most plausible explanation of migraine is that it is due to spasm and subsequent dilatation of cerebral arterioles. If this theory were correct and, further, if such vascular spasm were evoked by nervous impulses reaching the cerebral vessels by the sympathetic nerves, it might be hoped that migraine would be relieved by the administration of drugs possessing a paralytic effect upon the sympathetic nerve-endings. Such a possibility led Dr. Arnault Tzanck[1] to treat migraine with ergotamine tartrate, a drug which is credited with an inhibitory effect upon the sympathetic. Dr. Tzanck, in introducing his report on this treatment, comments on the ineffectiveness of numerous other therapeutic measures. The number of cases treated with ergotamine was small, but the results obtained were sufficiently encouraging to warrant its employment on a larger scale. The dose was 2·0 mg. of ergotamine tartrate daily by the mouth, an additional 2·0 mg. being given at the threat of an attack. After a time it was often found possible to reduce the dose to 1·0 mg. a day. Treated on these lines eight patients subject to typical recurrent attacks of migraine improved, the intervals between their attacks being lengthened from a few days to two or three months. It was sometimes possible to abort an attack by administering a dose as soon as the first symptoms appeared. Three other patients suffered from "a veritable status migrainosus," being hardly ever free from pain. Two of these were almost cured: the third abandoned the treatment. In a case of ophthalmic migraine the headache was almost completely relieved, but the ocular manifestations persisted, though in an attenuated form. Dr. Tzanck observed no ill-effects in patients taking as much as 60 mg. of ergotamine tartrate a month, but he recommends careful supervision on account of the reported occurrence of gangrene following the administration of this drug, an event which if true is difficult to reconcile with its reputation as a depressor of the sympathetic. Dr. Tzanck wisely refuses to draw any theoretical conclusions as to the cause of migraine from the success of ergotamine in its treatment.

SPLENIC TUMOURS DUE TO FUNGI.

ATTENTION was drawn in these columns[1] some months ago to the evidence produced by Emil-Weil, Chevalier, and Flandrin, in France, to the effect that many cases of splenomegaly clinically of the Banti type are really due to a mycotic infection. Evidence that tumours of the spleen apparently malignant, even to the extent of producing distant metastases, may also be due to a mycelial infection, is now brought forward by the same authors.[2] They describe the case of a young man who suffered from 1920 to 1923 from progressive enlargement of the spleen, at the end of which time the organ was removed and weighed 62 kg. He made a good recovery, but in the following year developed a tumour of the occipital region, fixed to the bone, which ultimately attained the size of an orange. This disappeared under treatment with X rays, but its disappearance was associated with the development of symptoms of intracranial tumour. Relief was gained by decompression but the symptoms returned and death ensued in 1926, three years after the splenectomy. Examination of the spleen showed it to be filled with dense, firm tumour masses, and macroscopically a confident diagnosis was made of the "pseudo-sarcoma" of Letulle and Jacquelin. Serial sections, however, showed the tumour masses to be actually united into one, and microscopy revealed the presence of a dense fibrous stroma and of well-formed blood-vessels, both incompatible with the diagnosis even of a "pseudo-sarcoma." The actual tumour consisted of masses of lymphoid cells, with scanty larger cells, having two or more nuclei; portions of it showed hæmorrhage, calcification, and a plentiful deposit of iron pigment, such as was described by Gamna in his "hæmosiderotic" splenomegaly. Further examination revealed in these hæmorrhagic areas structures of a filiform nature which the authors believe to be the mycelial elements of a fungus; in some cases terminal organs which might be sporangia were detected. These supposedly mycelial elements stained poorly with hæmatein and did not take any other of the ordinary microscopic dyes—but they stained well with ferrocyanide and hydrochloric acid, giving the blue reaction of iron. So long ago as 1913 Dr. A. G. Gibson[3] demonstrated the presence of myceloid elements in the spleens from certain cases of splenomegaly, and the present observations of Emil-Weil and collaborators, which bear upon the ætiology of Hodgkin's disease, should stimulate further research along the lines laid down by Gibson. The confirmation of his work so long after its performance, and by observers apparently unaware of his findings, must be regarded as highly significant.

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[1] Bull. et Mém. Soc. Méd. des Hôp. de Paris. June 28th, p. 1057.

[1] THE LANCET, 1928, i., 767.

[2] Le Sang, 1928, ii., 361.

[3] Proc. Roy. Soc. Med., 1913 (Med. Sect.), 7, and Quart. Jour. Med., 1914, vii., 153; see also J. Fawcett and A. G. Gibson, THE LANCET, 1928, i., 1171.

SUPRARENAL APOPLEXY.

Dr. Felix Pearl and Dr. Harold Brunn,[1] of San Francisco, who describe a case in a man, aged 45, which has come under their observation, remark that hæmorrhage into the suprarenal gland, though not infrequently found in infancy, is a rare condition in the adult, only 20 instances of bilateral suprarenal apoplexy in adults having been reported since 1906. The ætiological factors suggested have been thrombosis, capillary emboli, congestive diseases, infections and toxins, diseases of the solar plexus, surface burns, and the hæmorrhagic diathesis. The cases have been classified by Arnaud into three types—peritoneal, asthenic, and nervous. Any combination of symptoms may form the clinical picture, but asthenia is the most constant and characteristic of all symptoms. Physical signs are usually of no assistance in locating the seat of the disease. There may be merely vague tenderness in the lumbar regions or epigastrium or abdominal distension as in the present writers' case. There is no pigmentation of the skin as in Addison's disease. The diagnosis has only once been definitely made before death, in a case reported by N. B. Foster in 1920, but the presence of severe abdominal symptoms, with few or no physical signs, in a patient who presents definite nervous manifestations, profound asthenia, and gradual decline of blood pressure, should suggest acute adrenal disease. The prognosis is hopeless in well-marked bilateral cases, but small hæmorrhages may be absorbed without sequelæ. Treatment of bilateral suprarenal apoplexy is usually unsuccessful. The best results are likely to be obtained by injection of normal saline, Ringer's solution, and extracts of adrenal cortex or whole suprarenal gland. Epinephrin is ineffectual. Although operation is of no benefit in well-marked bilateral cases, it may be the only hope where there is massive unilateral hæmorrhage and where death is likely to be due to severe hæmorrhage and shock rather than to suprarenal failure.

THE Royal College of Physicians of London will commemorate its benefactors on Thursday, Oct. 18th, when the Harveian Oration will be delivered by Sir Humphry Rolleston, at 4 P.M., in the large library. The annual sermon at the Church of St. Mary-le-Bow will be preached at 11 A.M. on the same day, and in the evening the commemoration dinner will be held in the College at 7.30 P.M.

OUR advertisement columns contain an official notice of the forthcoming election of two members to the General Medical Council, to represent the registered medical practitioners resident in England. A group of not less than 12 practitioners is entitled to nominate a candidate, and nominations must be delivered in proper form to the Registrar of the Council on or before Oct. 13th.

OPENING OF THE LONDON MEDICAL SCHOOLS.

ADDRESSES AND ANNUAL DINNERS.

Charing Cross Hospital.—Prizes will be distributed at the hospital on Thursday, Oct. 4th, at 3.30 P.M., by Dr. Thomas Watts Eden. The annual dinner will be held at Gatti's Restaurant on the same day at 7 for 7.30 P.M., with Sir Herbert Waterhouse in the chair.

Guy's Hospital.—The session will begin on Tuesday, Oct. 2nd, but there will not be an opening ceremony.

King's College Hospital.—An introductory address will be given at the Medical School at 2.30 P.M. on Wednesday, Oct. 3rd, by Mr. Ernest Barker, professor of political science, in the University of Cambridge. Sir William Watson-Cheyne, F.R.S., will preside. The annual dinner of past and present students will be held at 7.30 P.M. on Wednesday, Oct. 3rd, at the Trocadero Restaurant, Piccadilly-circus, W., with Dr. B. R. Turner in the chair.

London Hospital.—The old students' dinner is to be held at the Trocadero Restaurant on Thursday, Oct. 18th, at 7.30 P.M.

London (R.F.H.) School of Medicine for Women.—An introductory address will be given at the school at 3 P.M. on Monday, Oct. 1st, by Dr. Andrew Balfour, whose subject will be the Tropical Field, its Possibilities for Medical Women.

Middlesex Hospital.—Mr. A. E. Webb-Johnson will deliver an introductory address, entitled the Enemies of Man, at the Queen's Hall at 3 P.M. on Tuesday, Oct. 2nd, after which Prince Arthur of Connaught will distribute prizes and Princess Arthur will present the Fardon Memorial medals. The annual dinner will be held at the Savoy Hotel on the same day at 7.30 P.M., with Prince Arthur in the chair.

Pharmaceutical Society of Great Britain.—On Wednesday, Oct. 3rd, at 3 P.M., an inaugural sessional address will be given by Mr. Reginald R. Bennett, chairman of the British Pharmaceutical Conference. A presentation of the Pereira medal will be made. On the same day, at 6.45 for 7 P.M., the anniversary dinner will take place at the Hotel Victoria, Northumberland-avenue, W.C. 2.

Royal Dental Hospital.—The dinner of past and present students will be held at 6.30 for 7 P.M. on Saturday, Oct. 20th, at the Trocadero Restaurant. Mr. G. G. Campion will preside.

St. Bartholomew's Hospital.—The old students' annual dinner will be held in the Great Hall of the hospital at 7 for 7.30 P.M., on Monday, Oct. 1st, with Sir D'Arcy Power in the chair.

St. George's Hospital.—The prize distribution will be held in the Board Room of the hospital at 3 P.M. on Monday, Oct. 1st, when an inaugural address, entitled Hydrocephalus: A Study in Phylogeny and Pathology, will be delivered by Sir John Bland-Sutton The annual dinner will be held on the same day at the Hyde Park Hotel at 7.15 for 7.45 P.M. The chair will be taken by Dr. W. S. Fox.

St. Mary's Hospital.—The annual dinner of past and present students is to be held at the Trocadero Restaurant on Friday, Oct. 5th, at 7 P.M.

St. Thomas's Hospital.—The old students' dinner will be held at St. Thomas's House on Friday, Oct. 26th, with Mr. Edwin Francis White in the chair.

University College Medical School.—The session will open on Monday, Oct. 1st, when Sir Thomas Barlow, F.R.S., will give an introductory address in the Library at 4.30 P.M. The annual dinner of past and present students will take place at the Hotel Cecil on Friday, Oct. 12th, Surgeon Vice-Admiral Gaskell in the chair.

Westminster Hospital.—An inaugural address will be given in the Board Room of the hospital on Monday, Oct. 1st, at 3 P.M., by Mr. A. C. Powell, headmaster of Epsom College. Sir William Goschen will take the chair. The hospital dinner is to be held on the same day, at 7 P.M. for 7.30, at Gatti's Restaurant, Strand, W.C., Sir James Purves-Stewart presiding.

DONATIONS AND BEQUESTS.—A cheque for £1000 from an anonymous donor has been handed to the Glasgow Dental Hospital by a chartered accountant of the city.—Miss Martha Mills, of Nottingham, left £1000 to the Nottingham General Hospital for the endowment of a bed in memory of her brother-in-law, Morris Weisblum, and £100 each to Dr. Barnardo's Homes and the Nottingham General Hospital; £50 each to several other charities.—Mr. Miles Daniel Whitehead, of Kingstown, Co. Dublin, left £500 to the Drogheda Memorial Hospital at the Curragh, Co. Kildare, and £400 to Laura Hitchins, and the income for life from 800 shares in the Imperial Tobacco Co., with remainder to the Manchester Royal Infirmary if Laura Hitchins predeceased him.

PRESENTATION OF WILLIAM MACKENZIE MEDAL.—This medal, given for valuable contributions to ophthalmology, will be presented to Dr. A. Maitland Ramsay at the Glasgow Eye Infirmary, on Tuesday, Oct. 9th, at 8 P.M., when Dr. Ramsay will deliver an address on the Importance of General Methods in the Treatment of Eye Disease.

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[1] Surgery, Gynecology, and Obstetrics, September, 1928, p. 393.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

V.—THE INTERPRETATION OF REPORTS ON SPUTUM.

BY S. ROODHOUSE GLOYNE, M.D. LEEDS,
D.P.H. LOND.,
PATHOLOGIST TO THE CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS.

(2)* CELLULAR AND BACTERIAL CONTENT: UNUSUAL SUBSTANCES.

Cellular Content.

THE cells of the sputum are often difficult to differentiate, but when they can be identified they are helpful in diagnosis. The dominance of large squamous epithelial cells indicates a condition of pharyngitis or coryza. Polymorph cells in large quantities are, of course, found in any purulent sputum and are not diagnostic of any special disease. They can be found in small numbers in specimens of sputum which are not purulent. In uncomplicated phthisis they are, as a rule, not very conspicuous, and when they predominate point to secondary infections. Alveolar cells from the lung are not easy to distinguish; they predominate in pulmonary tuberculosis. Ciliated bronchial epithelium is most difficult to detect even with special methods of staining, owing to the fact that it readily degenerates when the ciliated processes become unrecognisable. Malignant cells cannot be recognised with any degree of certainty, though large cellular plaques of cells are often suspicious. It is sometimes stated that predominance of the lymphocyte is an early sign of pulmonary tuberculosis. In the writer's experience this is not so. A predominance of eosinophil cells is often found in true asthma. Saliva and mucus contain few cells.

The Bacterial Flora.

The tubercle bacillus, suitably stained by the accepted Ziehl-Neelsen technique, is easy to recognise when present in any considerable number. Difficulty arises when the bacilli are very scanty. In doubtful cases of pulmonary tuberculosis it is advisable to examine a fresh specimen of sputum daily for at least a week before being satisfied that they are not present. Much depends on selecting the typical "nummules" in the sputum for examination. If search by this method fails a concentration test may be made. Several drachms of sputum are mixed with an equal amount of 5–10 per cent. antiformin; the mixture is allowed to stand for 15 minutes or so until the sputum is disintegrated, and then centrifuged, washed with water, recentrifuged, and a film of the deposit stained by the usual method. Unfortunately the method cannot be applied to a large series of specimens at one time, as in the ordinary film examination for *B. tuberculosis*, and therefore time does not permit its use as a routine. The method is said to increase the positive findings for tubercle bacilli by about 1 per cent. A daily examination by the ordinary film method for a week is equally efficacious and less laborious where large numbers of specimens have to be dealt with. The presence of large numbers of tubercle bacilli does not necessarily signify an acute infection. Chronic cases in fairly good health often have many bacilli in their sputum. A report on the number of bacilli seen per field of the microscope is therefore not of great value. Moreover, the actual count is dependent on variable factors such as the thickness of the film. At one time much stress was laid on the presence of so-called involution forms of tubercle bacilli as an aid to treatment and prognosis. It is doubtful if this sign is of any value.

In uncomplicated phthisis the sputum contains very few organisms other than the tubercle bacillus, but in the late stages of the disease catarrhal infections may be superimposed, and then the secondary organisms are many and various. Non-pathogenic acid-fast organisms are sometimes met with in sputum, but they are generally readily distinguished from the tubercle bacilli by their shape, size, and arrangement, and by the fact that they are rarely alcohol-fast and do not resist treatment with antiformin. Such bacteria generally come from the nose or ear. In case of doubt recourse must be had to guinea-pig inoculation.

Three or four years ago pathologists were frequently asked to report on the type of pneumococcus in cases of pneumonia, prior to the administration of anti-pneumococcal serum, but of late the practice has much diminished—presumably clinicians are not satisfied with the results of the serum treatment. Three types of pneumococcus are recognisable by means of agglutinin or precipitin tests. Types I. and II. are most commonly found in uncomplicated pneumonia and type III. in the rapidly fatal cases. Hæmolytic streptococci are not uncommon in the purulent sputum of "influenzal" broncho-pneumonia and imply a serious prognosis. Organisms of the coliform group are common in the fœtid sputum of bronchiectasis and pulmonary abscess. *B. pyocyaneus* is found in the same condition.

In interpreting a report on the bacterial flora other than *B. tuberculosis*, it is frequently difficult to know what emphasis to place on the different findings. Much depends on the efficiency with which the patient has washed out his mouth before expectorating the sample. Sarcinæ, leptothrices, yeasts, and even *Staphylococcus albus* are of very little significance. The so-called diplo-streptococcus also is not as a rule of much significance. Pneumococci, streptococci, *M. catarrhalis*, *B. pneumoniæ* Friedländer, and *B. influenzæ* are of pathological significance. Any combination of them may be found together and they are all common during the catarrhal seasons of the year, irrespective of the anatomical situation of the lesion. A bacteriological report should state which of the species predominates. It is sometimes said that any species found to be intracellular is of special pathological significance. As stated above, a sputum crowded with organisms of all kinds, especially if the sputum be foul smelling, is very suspicious of bronchiectasis or pulmonary abscess. When "granules" are found in the sputum actinomycosis fungi should be searched for. This disease is characterised in the lung by its frequent association with "pointing" empyema and may follow operation for appendix abscess. Others of the higher bacteria—e.g., mucor and aspergillus—are also sometimes found in sputum associated with bronchitis. It must be remembered, however, that mucor especially may be an accidental contamination, and its presence should be confirmed by repeated examination. As a rule these cases give a history of some occupational risk or dusty trade.

Unusual Substances.

Curschmann's spirals and Charcot-Leyden crystals are, of course, associated with true spasmodic asthma; and *Entamœba histolytica* with tropical abscess rupturing through the diaphragm. The latter is characterised by "anchovy paste" sputum. When search for the entamœba is required, the specimen of sputum should be as fresh as possible. Fibrin is found in sputum where there is extensive lung tissue destruction, as in chronic phthisis, bronchiectasis, and pulmonary abscess; it is the one object of search which necessitates a large amount of sputum for examination (an ounce or more).

Sputum may contain unusual substances such as pieces of sloughing mucous membrane, calcified nodules, or foreign bodies. These should always be sent to the laboratory for identification.

The hooklets of hydatid disease may also be found in sputum. Although this disease is not common in this country, it does sometimes occur associated with hæmoptysis or signs of lung compression.

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* Part (1) appeared in THE LANCET last week.

With regard to *animal inoculation tests*, now that pneumococcus typing tests—for which the mouse was generally used—are only occasionally made, the guinea-pig test for tubercle is the commonest inoculation test required. One of its disadvantages is the length of time which must elapse before a report can safely be made—i.e., about one month. In cases of urgency it is best to inoculate two animals and to kill one at the end of a fortnight, leaving the other to go on for a month or six weeks.

Special Articles.

SOME CONSTITUENTS OF DRIED YEAST AND YEAST EXTRACTS.

THEIR APPLICATION IN HUMAN NUTRITION.

By STANLEY G. WILLIMOTT, PH.D. CAMB. AND LIVERP., B.SC.;
AND
FRANK WOKES, B.SC., F.I.C.
(*From the Biochemical Laboratory, Cambridge.*)

IN a recent discussion in THE LANCET[1] on the relative food value of white and wholemeal flour the suggestion was made that the admitted deficiency of vitamin B in white flour might be made good by yeast. "Any lack of vitamin B in white flour is definitely remedied when the flour is made into bread by the addition of yeast."[2] No data, however, were offered concerning either the vitamin content of different yeasts or the amounts of these yeasts which are normally employed in bread-making. In the absence of this necessary information the suggestion has, not unnaturally, been severely criticised.

In the meantime, progress in improvement of the staple cereal food of the nation appears to have reached a deadlock. Reasons for this are not hard to find. Perhaps one of the strongest is the conservative attitude adopted by most people towards a suggested radical change in the largest part of their diet. Bread, on an average, constitutes at least two-fifths of the diet of the mass of the population. The questions of appearance, palatability, coarseness of texture (often due to the bran employed), digestibility and keeping qualities have also proved to be important determining factors. Finally, there is the economic problem. Wholemeal bread is still slightly dearer than white bread.

This position is unfortunate, as by the proper use of yeast all these objections can be overcome. Yeast is undoubtedly a cheap and potent source of vitamin B, and abundant supplies are readily available. As long ago as 1910 Schaumann[3] obtained from yeast an extract of high physiological activity, but he drew no satisfactory conclusions regarding the constituents to which this activity was due. In 1912 Sir F. Gowland Hopkins[4] showed that yeast contained a potent growth-promoting factor which, in the light of further knowledge, was presumably vitamin B. During the last few years yeast and yeast preparations have been increasingly employed as standard sources of vitamin B. From these facts the idea has naturally arisen of supplying to white flour the missing vitamin B by the use of a potent yeast. The question which remains to be decided is the proportion of yeast necessary to be added to ensure a palatable bread of adequate potency.

On the manufacturing side experiments are already being made. There are now being placed on the market a number of white flours to which dried yeast in different proportions has been added. The results given by these modified flours, taken in conjunction with the laboratory findings here recorded, will be of great value in human nutrition. Every busy practitioner must feel somewhat bewildered at the number and the claims of proprietary preparations, purporting to contain vitamin B, with which his consulting room is constantly flooded. In these circumstances impartial scientific data may be of service. An investigation was therefore undertaken into the possibility of employing dried yeast and yeast extracts to supply the constituents lost in the removal of the wheat germ by the usual milling processes of to-day. These constituents include vitamins, proteins, and various mineral salts. Amongst the latter, phosphates are perhaps of most interest on account of their relation to nerve nutrition, in which vitamin B (antineuritic factor) appears to play a part. In fact, so well recognised is this removal of minerals in modern milling processes that one classification of flours is based on their mineral content. The most highly refined white flour, for example, is generally found to contain less than 0·4 per cent. of minerals, an average seconds flour from 0·7 to 0·8 per cent., and a wholemeal 1·0 per cent. or more, as compared with 1·4 to 1·9 in the whole wheat berry.[5] Of the total minerals, roughly two-thirds consist of potassium phosphate.

Another staple cereal food, rice, also has its vitamins and its minerals, especially phosphates, removed by modern milling processes. Unpolished rice was found by Fraser and Stanton[6] to contain about twice as much phosphate as polished rice. In the earlier work on beri-beri the curative substance was believed to be either itself an organic phosphorus compound, or some other substance closely associated with such a compound. This view was officially adopted by the Far Eastern Association of Tropical Medicine. A resolution[7] was passed that rice containing less than 0·4 per cent. of phosphorus should be excluded by law from those countries in which this cereal formed the staple food grain. Later work,[8] however, disproved the suggestion that vitamin B is a phosphorous compound. But the association of vitamin B with phosphorous compounds in rice, wheat and other natural foodstuffs is still of great practical importance.

If the vitamin and minerals absent from white flour are to be adequately supplied by yeast preparations, these constituents must be present in sufficiently high concentration to furnish the necessary amounts of each factor when the yeast is added at a level practicable from the point of view of palatability, &c. The level at which fresh yeast is ordinarily added to flour in bread-making is variable, though always in the neighbourhood of 1 per cent.[9] The actual amount of yeast added depends upon the length of time the dough is to be fermented. Thus with 12 hours' fermentation the quantity of compressed yeast added just exceeds 0·1 per cent. of the weight of the flour, but with only one hour's fermentation the percentage of yeast employed rises to 1·4.[10] However, it is possible to add a suitable dried yeast to flour up to a level of 4 or 5 per cent., producing a flavour which is distinct but not disagreeable. Vienna bread, for example, which contains a large proportion of yeast, is noted for its palatability.

The proportion of dried yeast necessary to supply an adequate amount of vitamin B to white flour is about 3 or 4 per cent. of the flour used. Taking the average moisture content of fresh yeast as 70 to 80 per cent., this would be equivalent to approximately 15 per cent. of fresh yeast. Therefore the highest amount of fresh yeast known to be employed in bread-making—i.e., 1·4 per cent.—is only about one-tenth of what would be required to furnish sufficient vitamin B. These findings lend no support to the statement made by several investigators that "any lack of vitamin B in white flour is definitely remedied when the flour is made into bread by the addition of yeast,"[2] where fresh yeast is meant. On the other hand, our results show that it is possible to make good the deficiency by the proper use of dried yeast. In order to avoid undue fermentation by the large proportion of yeast, this must have been dried at a temperature sufficiently high to destroy the diastatic enzymes.

The fact that dried yeast has a distinctly bitter flavour has led to efforts to extract the vitamins and other valuable constituents from fresh yeast by treatment with suitable solvents which do not remove the bitter constituents so readily. The extracts thus obtained are exhibited in the liquid or semi-solid condition as a palatable adjunct to the diet. In such forms vitamin B is commonly prescribed to-day. The tendency of modern diets to be deficient in vitamin B [11] has afforded opportunity to manufacturers of such extracts to advocate their general use. Evidence has recently been put forward by Plimmer, Rosedale and Raymond [12] that the vitamin B potency of such extracts may vary as much as 200 or 300 per cent. Fresh brewers' yeast is known to have a high vitamin content. Therefore it appeared probable that this variation in vitamin activity was due, in part at least, to differences in the method of extraction employed. A consideration of these facts suggested the desirability of examining quantitatively samples of yeast and of extracts prepared from them. This necessitated ascertaining their content of vitamins by feeding experiment, and of mineral and other constituents by analysis.

Preparation of Yeast Extracts.

In preparing extracts of yeast for human consumption several points have to be considered. A solvent must be employed which will take out as much as possible of the vitamins and other desired constituents—e.g., phosphates—while leaving behind the unpalatable, bitter principles. (Vitamin B is now known to contain at least two factors, the antineuritic principle of Eijkman [13] or vitamin B, and the pellagra-preventive (P-P) factor of Goldberger [14] or vitamin B_2. Whenever the term vitamin B is used, both these factors are implied.) Vitamin B is known to be soluble in water, in aqueous solutions of certain salts, and in water-alcohol mixtures. By employing a suitable strength of alcohol (say, 75–80 per cent.) fairly complete extraction of the vitamin can be effected without dissolving any considerable proportion of the bitter principles.

On the commercial scale, where the expense of alcohol is an important consideration, satisfactory results can be obtained by heating the yeast with strong saline solutions under proper conditions. The exact conditions employed by different manufacturers are, of course, industrial secrets. Apparently the saline solutions employed vary widely in strength, from 2 to 10 per cent. or more, and the time of heating may be anything from half an hour to several hours. The destruction of the yeast enzymes without serious loss of vitamin potency is thus ensured. Finally, in view of the wide variation in composition of different batches of yeast, it is important to use raw material from carefully selected sources, and produced under properly controlled conditions. From recent work by Randoin and Lecoq [15] it appears probable that distillery yeast differs from brewers' yeast in not containing the antineuritic principle of Eijkman.

Perhaps the first yeast extract to be placed on the market was marmite. This preparation is a stiff, dark brown paste, containing about 27 per cent. of water, the same proportion of salts, and about a third its weight of nitrogenous matter (see Table I.). It can be rubbed down with water to form a dark brown liquid of a salty, bitter taste. It is noteworthy that this product contains a large proportion of salt (about 13 per cent.) compared with less than 0·2 per cent. in average samples of fresh yeast. Since its introduction marmite has been largely employed as a standard source of vitamin B both in clinical practice and in research. On account of variations in the activity of marmite, dried yeast is probably a more satisfactory standard for research work. For therapeutic use, on the other hand, an extract such as marmite is more convenient. Marmite was administered in large quantities as a prophylactic against beri-beri to the troops in Mesopotamia during the war. A tablet containing ¼ oz. of marmite was given once or twice a week to supplement the vitamin B content of the ration. In preparing these tablets some difficulty was experienced on account of the bitter taste. This was eventually overcome by admixture with suitable fat, such as bacon fat or cotton-seed oil.[16] In our own experiments it was decided to overcome the bitter taste of marmite, and also obtain greater accuracy of dosage, by making an alcoholic extract. 250 g. of fresh marmite, purchased on the open market, were extracted with 75 per cent. alcohol by mechanical shaking in a stoppered Winchester at room temperature for over three hours. The aqueous-alcoholic extract was then decanted off, and the alcohol removed by heating on the water bath at 80° C. for an hour, using broken pot to facilitate the distillation of the solvent. The work of Chick and Hume [17] shows that this treatment would destroy very little of the vitamin B present. When no more solvent distilled over, the dark-coloured aqueous extract remaining in the flask, containing the vitamin B, was filtered and made up to 250 c.cm. with distilled water. Thus 1 c.cm. of this extract was equivalent to 1 g. of marmite. It was almost free from the bitter taste of the original product.

It has recently been suggested by Plimmer [11] that the vitamin potency of marmite has diminished within the last few years, since a larger dose—i.e., 4 per cent. of the diet—is now required to produce the same curative effect as was previously obtained with only 2 per cent. Workers in other laboratories have experienced similar results (private communication). Since the earlier experiments were carried out, however, much more has been learnt of the necessity of balancing the vitamin B intake against various constituents of the diet (Funk,[18] Hartwell,[19] and Plimmer [20]). This knowledge has led to the introduction of more accurate methods of testing for the vitamin, and may be one of the causes of the apparent deterioration of the marmite. A further complication arises from the recent confirmatory work of Chick and Roscoe [21] that vitamin B contains at least two factors—viz., the antineuritic principle of Eijkman and the pellagra-preventive factor of Goldberger. Since both factors are necessary for the maintenance of health and growth (Chick and Roscoe), these criteria have been employed in our estimations of the vitamin B content of various extracts.

In addition to marmite, Plimmer [11] also tested five other samples of yeast extract and discovered a variation in vitamin B potency of 200 or 300 per cent. Some were weaker and others were stronger than marmite when tested on pigeons by the same procedure. Our own experience with rats having confirmed this wide variation in the content of the most important constituent, we considered it advisable to carry out experiments on the efficacy of industrial extraction methods. For this purpose it was necessary to obtain a standard supply of fresh yeast, prepare an extract from it under known conditions, and determine the amount of vitamin and other constituents both in the extract and in the residue. The data thus obtained should indicate the efficiency of the process for extracting the vitamins and other principles, and also afford some evidence on the significance of phosphates and other analysable constituents in yeast extracts. For the preparation of this experimental extract the raw material employed was a good quality brewers' yeast, obtained from a satisfactory source, in which strict analytical control was maintained over the purity of the product. Immediately after removal of the alcoholic liquor it was conveyed to the laboratory, and heated to 98° C. with a strong saline solution (about 5 per cent.) for several hours but not long enough to affect the vitamins. The extract was then cooled and filtered, using moderate pressure, and the filtrate, which was a brown liquid with a pleasant taste, was stored under refrigeration conditions during the investigation. Analysis of this experimental extract* showed that it contained only about one-third of the amount of nitrogenous derivatives found in commercial yeast extracts such as marmite. On the other hand, its water-content being double that of marmite, some reduction in vitamin potency might be anticipated. This reduction could have been obviated by concentration of the extract to a paste but, in view of the greater accuracy of liquid dosage, concentration was not attempted. The next step, therefore, was to ascertain by feeding experiments the comparative potency of the extracts in vitamin B.

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* A yeast extract, prepared in a similar manner and presumably of the same composition, has recently been placed on the market under the title "Verra" by Mr. Hugh Mapleton, of Garston, Liverpool, to whom we are indebted for supply of materials and certain manufacturing facilities.

Feeding Experiments with Yeast Extracts.

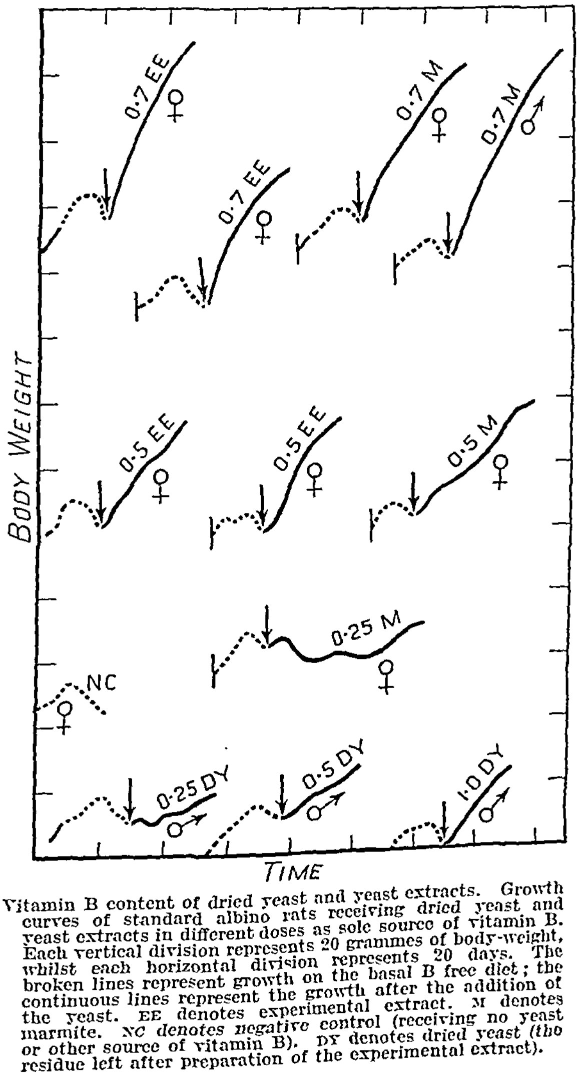
For an accurate assay of vitamin B it is essential that the basal diet shall be as free as possible from this vitamin. This can be ascertained by restricting a group of young standard rats to the basal diet whilst supplying vitamins A and D in the form of cod-liver oil. It is advisable not to attempt to supply vitamin C, because the usual sources of this vitamin are liable to be contaminated with vitamin B.[22] Moreover, it is well known that the absence of vitamin C does not appear to exert any prejudicial effect on the rat.[23] On such a vitamin B-free diet growth of all the rats should cease, and a steady decline in weight set in within two or three weeks. Precautions must be taken to prevent the animals gaining access to their fæces, which may serve as a source of the vitamin. The condition of the carbohydrate in the diet is of great importance, and constitutes a problem in itself. Recent work by Bacharach and Hartwell[24] indicates that on a diet lacking vitamin B the loss in weight appears more quickly when uncooked starch is employed.

The vitamin B deficient diet usually employed in Cambridge during recent years[25] has the following composition: raw potato starch, 40; sugar, 17; refined palm kernel oil, 15; purified caseinogen, 23; salt mixture, 5. This ration, with the addition of cod-liver oil, has usually been found to produce stoppage of growth within three weeks. In certain cases, however, irregular results have been obtained. Our most extreme case was one in which ten young albino rats after five weeks on the experimental diet were still increasing in weight, and showed an average growth increase of about half the normal. These abnormal results led to an examination of the diet for possible contamination with vitamin B. The caseinogen had been heated to above 120° C. for several hours and also had been well extracted with alcohol. It was therefore free from vitamin B. The palm kernel oil was also known by tests to be free from this vitamin. Since there is little storage of vitamin B in the body of the rat the discrepancy was traced by elimination to the potato starch. Potato starch has been used by many investigators as the source of carbohydrate in diets employed for the estimation of vitamin B. The Medical Research Council's Report on Accessory Food Factors,[22] for instance, states that starch is devoid of this vitamin. Nevertheless, our experience was that potato starch may contain sufficient vitamin B to affect seriously a vitamin assay. On replacing the potato starch of our synthetic diet by rice starch, without disturbing any other constituent, failure of growth in the normal period was at once secured (see Fig. 1) in this and other researches.[26]

A series of 12 standard albino rats (Wistar Institute strain) was then placed upon the improved vitamin B-free diet. In every case stoppage of growth had occurred within a fortnight, and before the end of the third week the weight was rapidly declining, and in several cases had reached the original level (see Fig. 1). The animals were now obviously in a poor physical condition, and in a few cases displayed premonitory symptoms of paralysis. The food intake was about 4 g. per head per day. At this point the yeast extracts were administered in doses ranging from 0·25 to 0·7 g., given separately to each animal in advance of the basal ration. One animal, which was continued on the vitamin B deficient diet as a negative control, died within a few days with definite symptoms of vitamin B deficiency. Considerable differences were observed between various animals in regard to the ease with which they accepted their doses of yeast extract. Small amounts of 0·25 g. were usually taken without difficulty, but a little sugar was found to assist the ingestion of larger doses. The marked loss of appetite is another difficulty and requires special precautions. During the actual consumption of the specified doses the animals occupied separate cages. In view of the apparent greater need of females for vitamin B[27] the experimental animals employed were mainly females. On the highest dose (0·7 g.) a male gave similar results to a female, allowing for the rather more rapid growth of the normal male. The initial weight of the animals has been shown by Osborne and Mendel[28] to have an important effect on the vitamin B requirement of rats. In the present experiments care was taken to place animals with similar initial weights on the same dose of the two extracts under test. Those with lowest initial weights were selected for the lower doses of the vitamin.

About a decade ago a number of workers found that an average dose of 0·25 g. of marmite was sufficient to restore normal growth in rats which were declining as a result of vitamin B deficiency. When, however, we tested this dose last year, either as original marmite or as the alcoholic extract, the growth response was very slight. Moreover, no significant difference in effect was observed between the original marmite or the alcoholic extract of it. (From this finding it was concluded that the method of extraction of vitamin B from marmite was reasonably efficient.) In Fig. 1 is given a typical result with this dose of 0·25 g., from which it will be seen that the animals' weight actually fell during the first two weeks of receiving the marmite. Nearly seven weeks of marmite dosage had elapsed before the animal regained and passed its initial weight. In this case recovery was finally achieved, but in several others,

FIG. 1.



Vitamin B content of dried yeast and yeast extracts. Growth curves of standard albino rats receiving dried yeast and yeast extracts in different doses as sole source of vitamin B. Each vertical division represents 20 grammes of body-weight, whilst each horizontal division represents 20 days. The broken lines represent growth on the basal B free diet; the continuous lines represent the growth after the addition of the yeast. EE denotes experimental extract. M denotes marmite. NC denotes negative control (receiving no yeast or other source of vitamin B). DY denotes dried yeast (the residue left after preparation of the experimental extract).

details of which have been omitted in order to save space, death supervened.

A dose of 0·25 g. of marmite having proved insufficient, the amount was now increased to 0·5 g., while two similar animals were put on the same dose of the experimental extract. The growth response was much better than with the 0·25 g. dose, and the experimental extract appeared to be at least as potent as the marmite, although containing only two-thirds the amount of total extractive matter. The rate of growth was still subnormal. A still higher dose of 0·7 g. was therefore tried, two animals being placed on marmite and two on the control extract. From Fig. 1 it will be seen that with this dose practically normal growth was secured with both the yeast extracts. The food intake was 8–9 g. per head per day. Possibly a dose between 0·5 and 0·7 g. might have proved adequate. From other experiments, we believe the minimum adequate dose to be not much below 0·6 g. These results might be taken to indicate that the vitamin B content of marmite has diminished to less than one-half of its original value during the last few years. Part of this apparent loss may be due to refinements in technique, and probably the figure suggested by Plimmer[11] of a 50 per cent. deterioration is more nearly correct.

Feeding Experiments with Dried Yeast.

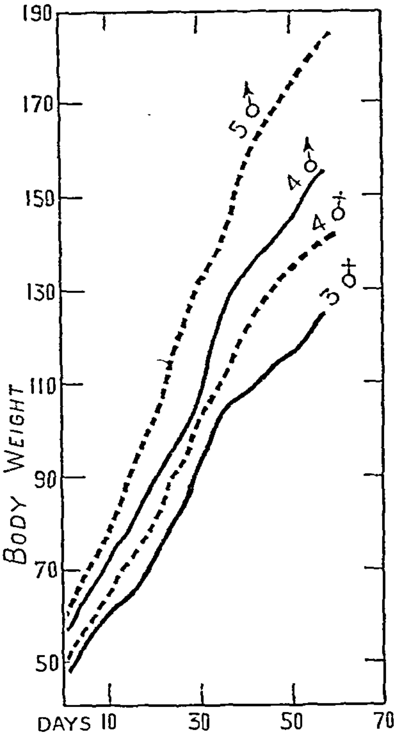
From the standpoints of industry and research alike, dried yeast is a most important source of vitamin B. The removal of the moisture produces, with proper precautions, a stable and highly concentrated product, very suitable for mixing with white flour in bread-making, to increase the vitamin B content; it has also been found the most satisfactory standard for assay work.[29] Experiments have shown that a good sample of dried yeast should restore normal growth when fed in doses of 0·3 to 0·5 g. to rats suffering from vitamin B deficiency. Taking the daily food intake as about 10 g. per head, this would mean from 3 to 5 per cent. of the diet. Some dried yeasts of unusually high potency may be effective in the proportion of 2 per cent.

The above experiments showed that it is possible to obtain from yeast an extract containing only 50 per cent. of solid matter, of which doses of about 0·6 g. are adequate. The next step was to determine how much, if any, vitamin B was left in the residue from which the extract had been prepared. For this purpose it was decided to remove all moisture from the residue, in order that it might be fed as a dry product. The residual sludge was dried by passage over steam-heated rollers in such a thin layer that less than one minute's exposure to the temperature of 100° C. sufficed to drive off practically the whole of the moisture. By this means any destruction of vitamin B was avoided. The product was in the form of thin light brown flakes, which were readily reduced to powder. Less than 1 per cent. of this powder failed to pass through a sieve of No. 40 mesh. Thorough mixing of the sieved powder ensured a product of uniform consistency, truly representative of the residue from which it had been obtained. The powder, when stored without any special precautions, underwent no noticeable deterioration in 12 months. Tests showed it to be free from diastatic enzymes. It was then fed to three rats suffering from vitamin B deficiency, in doses of 0·25, 0·5, and 1·0 g. respectively. The results, which are recorded in Fig. 1, indicate that 0·5 g. produced rather better growth response than 0·25 g. of marmite; 1·0 g. was about equal to 0·5 g. of the experimental extract. Allowing for the water content of the latter, the actual ratio of curative doses in the solid matter was therefore about 4 in the extract to 1 in the residue. Hence it would appear that the method of extraction employed had taken out roughly four-fifths of the total amount of vitamin B present in the raw material.

Nutritive Value of Yeast Protein.

In view of the high proportion of protein and other nitrogenous constituents in yeast, the question arises as to the possible value of these in nutrition, and the effects produced by their ingestion in large amounts. Various preparations of yeast have been used both for human and for animal food, and divergent opinions on their nutritive value are to be found in the literature. According to Berg,[30] the so-called "nutritive yeast," which was intended to be a rich source of protein for human consumption in Germany during the stringent times of the war, failed in its purpose. Others have reported that the protein of yeast is of low biological value. Hawk, Smith, and Holder[31] find that yeast protein cannot usefully exceed from 10 to 30 per cent. of the diet of man. If an excess of yeast is taken diarrhœa results. In view of these discrepant opinions, it was decided to test the dried yeast residue remaining over from the extraction process in the preparation of the experimental extract, and containing the larger part of the nitrogenous constituents of the original yeast. This was employed as the sole source of nitrogen, and was supplied in the unusually high concentration of 50 per cent. of the total ration, so that any possible toxic effect might be readily revealed.

FIG. 2.



Dried yeast as a source of protein. Growth curves of standard albino rats receiving dried yeast as sole source both of protein and of vitamin B. (Body-weight is shown in grammes.) Each curve is a composite one giving the average growth of a group of animals of the same sex. The continuous lines represent growth of the experimental groups receiving the whole of their protein in the form of dried yeast; the broken lines represent growth of control groups receiving their protein in the form of caseinogen. Apart from this difference, and the supply of vitamin B to the control groups as marmite, the diets were identical.

Seven albino rats of the same stock as previously used, and of about 52 g. initial weight, were restricted to the following diet:—

Dried yeast ..	.. 50	Cane sugar ..	.. 30
Palm kernel oil	.. 15	Salt mixture ..	.. 5

All the ingredients except the dried yeast had already been tested for their freedom from vitamin B. The dried yeast was thus the only source of this vitamin as well as of protein. As before, vitamins A and D were supplied in the form of cod-liver oil, while vitamin C was not provided. The bitter taste due to the high proportion of yeast was overcome by careful admixture with the fat, and by replacing the starch of the diet by sugar. In making up the diet, allowance was made for the carbohydrate carried by the dried yeast, so that the nutritive ratio of the original formula was not disturbed. The experimental conditions were the same as before.

After a few days the animals had become accustomed to the diet and the ration was readily consumed, the food intake rising gradually from 5 g. a day. All the animals grew at a steady though somewhat suboptimal rate. After eight weeks of experiment, the average increase in weight for the males was 100 g., and for the females 77 g., compared with 125 g. and 92 g. respectively for two other groups of animals on the complete ration containing caseinogen (see Fig. 2). The food intake had risen to 9 or 10 g., and all the animals appeared to be well nourished and had good coats and bright eyes, with no neuritic symptoms. Autopsies failed to reveal any pathological conditions.

It was concluded, therefore, that (1) the dried yeast constituted a satisfactory protein when fed at the level of 50 per cent. of the ration, (2) that it produced no deleterious effect when administered in quantities considerably larger than was necessary to supply sufficient vitamin B. No laxative effect was observed.

Analyses.

Chemical analyses were carried out on the same products as had been used in the feeding experiments, and on the raw materials from which these had been prepared. Total nitrogen was determined by the Kjeldahl-Gunning method. The factor 6·25 was used in estimating the protein. Fat was estimated by ether extraction in a Soxhlet apparatus, after careful removal of water at 100° C. Ashing was done in silica crucibles at low temperatures to avoid volatilisation of potash. Phosphorus was estimated according to the official directions published by the Board of Agriculture for the examination of feeding stuffs.

TABLE I.—*Percentage Composition of Yeast Products.*

—	Moist yeast.[1]	Dried yeast.		Yeast extracts.[4]		
		From marmite.[2]	From experimental extraction.[3]	Marmite.[3]	Cerema.[2 5]	Experimental extraction.[3]
Nitrogenous matter, including protein[6] ..	11–15	13·5	45·6	37·6	24·4	11·7
Carbohydrate	15–23	44·5	44·0	11·4	29·6	19·5
Fat[7]	0·4–1·0	0·9	1·3	—	—	0·5
Minerals[8]	2–10	8·6	5·0	24·2	17·4	19·1
Moisture	65–75	2·5	4·1	26·8	28·6	49·8
Total phosp. as P_2O_5[9] ..	0·5–1·0	—	1·6	4·2	—	2·0

Notes.

1. Summary of a number of results obtained by different workers.
2. Analysis n [illegible] authors on the material
3. Analysis r [illegible] analyses by other workers used in feeding [illegible] mposition of marmite. show consideral [illegible] [39] creatinine, a character-
4. Tested by [illegible] istic constituent of meat extracts for which these yeast extracts were introduced as substitutes, was found to be absent.
5. Cerema is a somewhat cheaper form of yeast extract [illegible] ite. [illegible] tute for the n [illegible] it [illegible] Plimmer and [illegible] ter. [illegible] of the vitamin [illegible]
6. The actual protein content of yeast has been found to vary considerably.
7. Fat content varies with conditions of nutrition. These are average figures.
8. This includes, in the case of the extracts, salts added for the purpose of extraction.
9. This includes both inorganic phosphates and organic phosphorus compounds (phospholipins and phosphoproteins).

TABLE II.—*Vitamin B Content (Composite Factors) of Dried Yeast and Yeast Products.*

—	Moist yeast.[1]	Dried yeast.		Yeast extracts.	
		From marmite.[1]	From experimental extraction.	Marmite.[5]	Experimental extraction.
Minimum curative rat dose (g.)[2]	0·5–0·8	0·2	1·0	0·4–0·6	0·6
Minimum percentage in diet of rats[3]	5–8	2	10	4–6	6
Minimum percentage in human diet[4]	7–12	3	15	6–8	9

Notes.

1. Data given by Plimmer and other workers.
2. Minimum dose which will restore normal growth when supplied as sole source of vitamin B to standard rats of 40 to 60 g. weight suffering from vitamin B deficiency.
3. Assuming that food intake is about 10 g. per head per day.
4. Using Plimmer's figure[33] for vitamin B requirement of human beings—i.e., 1½ times that of the percentage requirement of rats.
5. Average results obtained in recent work by other investigators[24 34] and ourselves.

The results of these analyses are summarised in Table I., which also contains some data obtained by previous investigators on certain yeast products. Wide variations are shown in the composition of yeast preparations made by different methods. These may be due partly to differences in the raw material, and partly to differences in the methods of extraction employed. But in view of these wide variations in accurately analysable constituents, it is not surprising to find even greater difference in the vitamin B content of these yeast preparations, as shown in Table II.

Discussion.

It has already been pointed out by Cramer and Mottram[35] that the white and wholemeal bread problem has suffered much confusion from inaccurate statements on the one hand and the unproven claims of enthusiasts on the other. The facts that have been presented show that there is justification for this view. In the past, studies on the nutritive value of white and wholemeal bread appear to have centred round the questions of the relative protein content and the calorie value. Differences undoubtedly exist, but analysis shows that such differences are too slight to be of real importance. In recent discussions, the importance of the content of vitamin B (and other constituents) of bread, the staple cereal food, has been fully recognised on all sides. Divergence of opinion, however, is encountered on such questions as the adequacy of white bread in vitamin B and how best it may be fortified. Cramer and Mottram have clearly demonstrated that the modern milling processes used in the manufacture of white flour are responsible for a considerable loss of vitamin B amongst other constituents. This decline in nutritive value has been admitted by all serious students of the bread problem since the time of Liebig,[36] who stated that "the whiter the flour the less nutritive value it possesses." But, as previously pointed out, the suggestion has recently been made that any lack of vitamin B in white flour is rectified when the flour is made into bread by the added yeast. This contention has not been verified by the experimental facts. Cramer and Mottram have shown that the highest proportion of yeast normally employed in bread-making will not supply white bread with more than one-seventh of the amount of the vitamin found in good wholemeal bread.

A number of solutions of the problem have been proposed. During the war, for instance, Weill and Mouriquand[37] used an extract of bran in place of the bran itself in making bread. Greig and Curjel[38] employed wheat germ as a source of vitamin B, adding it to zwieback in the proportion of 15 per cent. Such bread was found to be a satisfactory means of protecting the English colonial army against beri-beri. This solution, apparently successful during the abnormal times of war, might not necessarily be satisfactory in peace. In ordinary wholemeal bread the proportion of germ varies from 1 to 2 per cent. This amount supplies only a small fraction of the vitamin B required. If wheat germ is to supply an adequate amount of this factor, it must be used in much higher proportion; for example, Hovis germ bread contains about 24 per cent. This method of enriching bread with its lost constituents is hardly a satisfactory solution. Wheat germ must first be detoxicated before it can be used in bread-making, and is more costly as a source of vitamin B than dried yeast. Moreover, it is economically unsound because, in order to provide this unusually high percentage of germ, a much larger quantity of flour (more than 12 times as much) must be robbed of the vital constituents in the germ.

Cramer and Mottram propose to solve the problem by replacing white by wholemeal bread. In practice, however, a number of difficulties at once arise. Amongst these are the questions of appearance, palatability, digestibility, texture, keeping qualities, price and, last but not least of the difficulties, the conservative attitude of the consumer. It is true that some of these obstacles can be overcome by fine grinding of wholemeal flour and improvements in the methods of baking. But a consideration which appears to have been overlooked by many investigatoıs is the extensive change in the existing milling plant which would be necessary. Serious difficulties arise when the attempt is made to produce a satisfactory wholemeal flour by the modern roller mills in general use to-day in the manufacture of white flour. The total replacement of white bread by wholemeal would probably involve the alteration, perhaps even the scrapping, of much expensive milling plant. Such a contingency would inevitably mean a considerable rise in the price of this staple foodstuff.

In view of these difficulties, a practicable *via media* is offered by the method of adding dried yeast in proper amount to ordinary white flour. An average dried yeast is several times more potent in vitamin B than the fresh yeast employed in bread making. Such a product, used in the proportion of 2 to 4 per cent. of the flour, would yield a bread containing as much vitamin B as is found in the finest wholemeal product (see Table II.). Moreover, from our own experience we can state that a white bread fortified by the addition of dried yeast can be quite palatable and in no way offend æsthetic susceptibilities. Many indeed would not realise that they were consuming anything but ordinary bread. Since dried yeast is a by-product in large industrial processes, supplies are readily and cheaply available. Finally, this method of supplying vitamin B, as well as phosphates and other valuable constituents missing from white flour, necessitates no expensive new plant, nor the scrapping of that already in operation.

Up to this point the use of dried yeast has been considered in a prophylactic capacity only. Often, however, the physician desires to administer larger quantities of vitamin B to make good, as rapidly as possible, a serious deficiency. In such cases yeast extracts appear to be very satisfactory because they can be easily administered in large and controlled doses. They should possess a high potency in vitamin B, varying only within small limits. Commercial extracts may vary in vitamin B potency by several hundred per cent., but our results have shown that a potent yeast extract can be made, under properly controlled conditions, by a simple inexpensive method. The product thus obtained was at least as active in vitamin B as the more expensive marmite. Being in a liquid form, it is very suitable for therapeutic and domestic use.

One or two important provisos should be made. The dried yeast which is to be employed in breadmaking should of course be examined for its constituents and specially tested for its content of vitamin B. Our own experiments indicate that the employment of dried yeast, even in high proportions, is free from the danger of introducing toxic constituents such as are found in wheat germ. Another consideration of the first importance is the growing practice of " bleaching " flour. Amongst the chemicals used for this purpose are ammonium persulphate, nitrogen peroxide, nitrogen trichloride, benzoyl peroxide, and chlorine. Apart from the probable inimical effects of these substances on health, which would be cumulative, their presence in bread would serve to lessen through oxidation the amount of active vitamin. From both points of view their use is both unnecessary and undesirable. The best immediate practical way of solving the bread problem, in the present situation, is to add dried yeast to flour.

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INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 15TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 92 (last week, 123); scarlet fever, 1977; diphtheria, 1021; enteric fever, 122 (last week, 108); pneumonia, 540; puerperal fever, 45; puerperal pyrexia, 92; cerebro-spinal fever, 6; acute poliomyelitis, 17; acute polio-encephalitis, 3; encephalitis lethargica, 13; continued fever, 1; dysentery, 6; ophthalmia neonatorum, 109. No case of cholera, plague, or typhus fever was notified during the week. The notifications of small-pox are under 100 for the first time for more than two years.

The following counties each notified 3 or more cases of enteric fever:—London, 21; Chester, 3; Devon, 5; Essex, 6; Gloucester, 8; Huntingdon, 4 (St. Ives); Lancaster, 3; Norfolk, 5; Northumberland, 3; Southampton, 8; Sussex East, 6; Warwick, 3; Yorks, East Riding, 5 (Pocklington); Yorks, North Riding, 3; Monmouth, 3. The total of 122 includes 27 cases of paratyphoid fever, of which 12 were notified in London.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Sept. 18th–19th was as follows:—Small-pox, under treatment 11, under observation 2; scarlet fever, 1647; diphtheria, 1466; enteric fever, 87; measles, 101; whooping-cough, 237; puerperal fever, 13 (plus 7 babies); encephalitis lethargica, 70; poliomyelitis, 2; "other diseases," 20. At St. Margaret's Hospital there were 17 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox (the last quarter has now been entirely clear), 2 (0) from enteric fever, 10 (1) from measles, 2 (1) from scarlet fever, 22 (6) from whooping-cough, 20 (5) from diphtheria, 125 (35) from diarrhœa and enteritis under two years, and 17 (5) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever were reported from Plymouth and Bristol. Of the 9 fatal cases of measles outside London 3 each were reported from Liverpool and Newcastle-on-Tyne, Belfast reporting 10 in the same week. There was a further slight increase in the number of deaths from diarrhœa, of which Liverpool reported 15; West Ham, Birmingham, Manchester, Leeds, and Middlesbrough 5 each; Bristol and Hull, 4 each; while Glasgow, Dublin, and Belfast reported 14, 9, and 7.

The number of stillbirths registered during the week was 274 in the great towns (corresponding to a rate of 41* per 1000 births), including 55 in London.

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* The rate was misprinted 89 for 39 last week.

POST-VACCINAL ENCEPHALITIS.

REPORT OF THE LEAGUE OF NATIONS COMMISSION.

AN important session of the Health Organisation of the League of Nations was held at Geneva from August 22nd to 25th. The report[1] of the proceedings has now reached us. Prof. Ricardo Jorge, Director-General of Public Health Services, Lisbon, presided, and those present were:—

Members of the Health Committee: Sir George Buchanan, Senior Medical Officer, Ministry of Health, London; Dr. H. Carrière, Director of the Federal Health Service, Berne; Dr. N. M. Josephus Jitta, President of the Health Council of the Netherlands, The Hague.

Experts: Prof. H. Aldershoff, Director of the State Serological Institute, Utrecht; Dr. F. R. Blaxall, Government Lymph Establishment, London; Prof. M. Camus, Director of the Superior Institute of Vaccine, Academy of Medicine, Paris; Prof. Dr. H. A. Gins, Robert Koch Institute, Berlin; Dr. H. Mervyn Gordon, St. Bartholomew's Hospital and College and Medical Research Council, London; Prof. A. Groth, Landesimpfanstalt, Munich; Prof. G. Sobernheim, Director of the Health Institute of the University, Berne.

The questions considered by the Commission were post-vaccinal encephalitis, and the preparation and preservation of vaccine lymph. The third subject on the agenda was the relationship between the different types of small-pox virus and those of certain human and animal pathogenic viruses, but it was decided to postpone discussion until the problem had been further examined.

A preliminary discussion on *post-vaccinal encephalitis* by a subcommission led to the framing of a report which was adopted by the Commission and is summarised below.

Terminology.—The term "post-vaccinal encephalitis" is used in the report for convenience, without necessarily implying that "post-vaccinal" is considered the equivalent of "propter-vaccinal." Some of the thousands, even millions, of persons who are successfully vaccinated in any given year must fall ill during this period in the ordinary chances of life, and they are no more immune from diseases specially affecting brain and nerves than any other persons. During recent years many countries have experienced a considerable prevalence of epidemic encephalitis (or encephalitis lethargica). The disease has no connexion with vaccination, but it may well be supposed that occasionally persons who have been recently vaccinated would be attacked by it as a matter of chance, like any others. The same consideration applies to chance coincidences between vaccination and attacks of epidemic poliomyelitis. Such rare coincidences, however, do not constitute the "post-vaccinal encephalitis" now under consideration. Encephalitis may occur as a complication of numerous infections, such as measles, or various forms of toxæmia, and it occurs, though rarely, as a complication of small-pox itself. It would be permissible clinically, and perhaps also pathologically, to group all such encephalitis under a single term, encephalitis *post-infectionem*. Vaccination is an infection. It is not implied that post-vaccinal encephalitis is not capable of being classed with, and attributed to, the same ultimate causes as "encephalitis *post-infectionem*," although there are practical reasons for considering it separately and by a separate name at the present time.

Cases in the Netherlands and in England and Wales.

The post-vaccinal encephalitis with which the report deals has become a problem of itself mainly in consequence of the events of the last few years in the Netherlands and England and Wales. In each of these countries the cases which have occurred have been sufficiently numerous and similar to require them to be considered collectively. Their occurrence has led to the realisation that a new, or at least a previously unsuspected or unrecognised, risk attaches to the practice of vaccination. This risk, when taken at its maximum value, is minute in proportion to the vast numbers of normal vaccinations to which the cases of post-vaccinal encephalitis correspond, and it is easy to exaggerate its importance. Nevertheless, it is one whose existence, in these two countries at any rate, has to be recognised, and its meaning considered. In fact, it has in the Netherlands been considered of sufficient gravity to cause the temporary suspension of the administrative measures by which the vaccination of children is secured, while in England the subject has already received the attention of two expert committees appointed by the Ministry of Health, the second of which (the Rolleston Committee) has now presented a comprehensive report,[2] embodying the information and conclusions arrived at by the first or Andrewes Committee, whose work was described to the Health Commission of the League of Nations in 1926.

In the Netherlands, 139 cases of disease of the central nervous system following vaccination were described during 1923 to 1927, of which 41 died. In England and Wales, taking the arbitrary periods dealt with respectively by the Andrewes and Rolleston Committees, 62 cases with 36 deaths occurred between Nov. 14th, 1922, and Nov. 1st, 1923, while a further group of 40 cases occurred between Jan. 1st, 1926, and Sept. 30th, 1927. Of these 40 cases, however, 15 were excluded by the Rolleston Committee on account of their doubtful nature, leaving for consideration 25 cases, of which 12 died, in the second period. The two combined, on this basis, gave a total of 87, of which 48 were fatal, for England and Wales during the two periods under investigation by these Committees.

The clinical characteristics of post-vaccinal encephalitis, as met with in both countries, are quoted from the Rolleston Committee report. Pathologically, the fatal cases have shown diffuse encephalomyelitis, the inflammation being mainly perivascular in type and often accompanied by œdema. The pathological changes in some instances resemble those found in acute disseminated sclerosis, and differ in essential respects from those met with in fatal epidemic encephalitis. The presence of the vaccinia virus in the brain tissue of certain of the fatal cases has also been definitely established. This fact, however, must be considered in the light of modern knowledge regarding the dissemination of this virus after vaccination. The brains were examined at a period after vaccination when it would be anticipated that the brains of many normal vaccinated persons, could they be tested, would equally yield the vaccinia virus.

"*Incubation period.*"—The period which usually elapses between vaccination and the onset of symptoms of encephalitis (the "incubation period") is from 9 to 13 days. The Rolleston Committee found that, out of 125 cases collected from the British and Continental sources, the onset was between the ninth and thirteenth day after vaccination in 94, and the most favoured day was the eleventh.

Age-incidence.—In both countries post-vaccinal encephalitis has occurred more rarely in infants under the age of two years than in older children and in adults.

During the four years 1924 to 1927 in the Netherlands 4 cases occurred among 126,124 vaccinations under the age of two years, as against 130 cases among 462,212 vaccinations between the ages of 3 and 12; in other words, 1 case to every 31,531 vaccinations at ages 0 to 2, and 1 case to every 3555 vaccinations at ages 3 to 12. The vaccination figures are based on the doses of lymph issued and not on the actual vaccinations performed; they are, therefore, an over- rather than an under-statement.

In England and Wales the predilection of the disease for older children has been equally notable, though figures comparable to the Dutch of vaccinations at ages are not obtainable. The vaccinations done by the public vaccinators in England and Wales under the vaccination law of the country are normally limited to the vaccination of infants under two years. But in the English series of 87 cases of post-vaccinal encephalitis referred to above, those under two years of age were only eight in number. During recent years, owing to the prevalence of small-pox, an exceptionally large number of school-children have been vaccinated who had escaped vaccination in infancy, and the

majority of the English post-vaccinal encephalitis cases have occurred among these school-children.

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Method of vaccination: source of lymph.—Most of the post-vaccinal encephalitis cases in both countries have occurred in children whose vaccination, to judge from all ordinary signs and cutaneous reactions, has run a normal course. No single method of vaccinating has been exclusively concerned. The American practice of using minimal quantities of vaccine lymph has, up to the present, been so little followed, however, in the Netherlands or in England that it is not possible to ascertain whether in any case encephalitis has followed the use of this method.

Many different vaccine lymphs have been used to vaccinate the cases which developed encephalitis, and no one source of lymph has been proved to be more associated with the occurrence of the disease than another.

The *geographical distribution* of the cases in each country has been wide.

The cases have chiefly occurred in those regions and at those times when organised vaccination of the population was in progress. Nevertheless, it is noteworthy that, both in the Netherlands and in England and Wales, there have been large populous areas in which vaccination has been carried out on a large scale on persons of all ages during the past four or five years without the occurrence of any post-vaccinal encephalitis. On the other hand, in certain rural districts, sometimes in quite small villages or rural communes, local vaccination has been attended by a relatively excessive proportion of encephalitis cases. Striking illustrations of this circumstance have been supplied in the Dutch reports.

Originally in the Netherlands the local distribution of post-vaccinal encephalitis showed a notable degree of correspondence with the local distribution of known cases of epidemic encephalitis (encephalitis lethargica), but this correspondence has not been maintained in the later series of Dutch cases, and has never been established in any of the English series.

In no country other than the two under discussion has the occurrence of encephalitis been on any considerable scale, but cases of the same sort have been reported in 1922 from Portugal (1); in 1924 from Prague (8), from Switzerland (2), and Germany (3); in 1927 from Poland (2), and the United States (4); and in 1928 from British Guiana (1).

Research has so far failed to give any sufficient or generally accepted explanation of the cause or causes of post-vaccinal encephalitis. The questions whether the appearance of post-vaccinal encephalitis can be checked by the habitual use of smaller doses of vaccine, or by the adoption of different methods of vaccination, are being studied in the countries specially affected. It is hoped, however, that the proposals, in the second part of the report, for international expert coöperation in the study of the different viruses allied to vaccinia; of the effect of diluting vaccine lymph; of the use of antiseptics in lymph preparation, and so forth, may prove to be of use, directly or indirectly, to those who are doing research work on post-vaccinal encephalitis.

Cases in Other Countries.

From the international point of view, it is important that further inquiries should be made as to the existence of post-vaccinal encephalitis in countries other than the Netherlands and England and Wales. If, as it appears, the condition is one which occurs with the utmost rarity among infants vaccinated under the age of two years, and if also it is the fact that post-vaccinal encephalitis is similarly of the utmost rarity after revaccination of older children or adults, it is probable that there are many countries in which little or no post-vaccinal encephalitis is likely to occur. In these countries, the great majority of the population is vaccinated in infancy. But, on the other hand, there are certain countries in which, like the Netherlands, primary vaccination at school age is habitually practised, or in which, as in England, large numbers of children of school age or adults are vaccinated for the first time on account of the appearance of small-pox. It is in such instances that the establishment of the negative, after full inquiry and observation, would be of the greatest value as a control to the English and Dutch experience.

It is fallacious to expect these cases to be brought to the notice of the Central Health Authority merely through the ordinary channels of infectious disease notification. This fact may be attributed either to failure on the part of the practitioner to connect the subsequent illness with previous vaccination, or to the fact that the doctor in attendance on the case during the nervous illness is not the one who performed the vaccination. A further complication in the inquiry is the occurrence of transient cases, or cases with indefinite symptoms, which are readily considered by the practitioner to be due only to vaccination. The four cardinal symptoms of the disease (temperature, vomiting, headache, and drowsiness) may each or all occur in course of normal vaccination in a young child.

The possible fallacies of a negative return from either a country or districts in a country are therefore very great, and a statement that cases of post-vaccinal encephalitis do not occur in a given locality can only be of value if made after most careful inquiry on the spot by a competent investigator, who has access to doctors, hospitals, schools, and all other sources of information in the area. Inquiries are to be made with a view to indicating a limited number of countries or regions which would be appropriate for such investigations.

Conclusions.

The facts and considerations which have been before the Small-pox and Vaccination Commission at its present session seem to permit the following conclusions:—

(*a*) The foremost of these is the rarity of cases of post-vaccinal encephalitis, even in the countries specially affected, by contrast with the number of vaccinations. We are in fact concerned with a minimal proportion of them. (*b*) Apparently the matter is not one in which mere coincidence between vaccination and encephalitis can be invoked; in other words, we are not dealing with a merely fortuitous occurrence. (*c*) In our present state of knowledge we must conclude that post-vaccinal encephalitis is a different disease from encephalitis lethargica. The conditions under which post-vaccinal encephalitis has manifested itself in the Netherlands and in England and Wales tend to show that children between 3 and 13 years of age are particularly susceptible, whilst infancy and adult ages are almost wholly exempt. All observations point to the conclusion that the appearance of encephalitis is not connected either with particular strains of lymph or with particular accidents of lymph preparation. (*d*) Passing to the ætiologico-pathological side of the problem, it would appear in our present state of knowledge that the virus of vaccinia of itself cannot be considered responsible for the supervention of encephalitis. Rather it has to be supposed that some unknown factor exists—perhaps bacterial or a filter-passing virus, or a latent virus—which, by means of a reciprocal reaction, determines the occurrence of the accidents in question.

None of the facts considered in this report lead the Commission to the conclusion that there is reason for discontinuing the use of vaccination, which remains the most powerful weapon against small-pox that we possess.

In view of the circumstances associated with the occurrence of nervous complications which, as explained in the first part of this report, are in any case of extreme rarity, the Commission draws attention to the advantage which may result from practising primary vaccination during early infancy rather than at later ages of childhood.

HALF A MILLION FOR HOSPITALS.—To celebrate his seventy-eighth birthday in December next, Mr. Bernhard Baron, the cigarette manufacturer, has created a trust and endowed it with £575,000 four per cent. Consolidated Loan, to be called "The Bernhard Baron Charitable Trust for Hospitals and Asylums for Orphans and Crippled Children." The trust is to endure for 20 years, and the trustees are to apply annually as nearly as possible an equal proportion of the capital and income to the prescribed purposes. Twenty-five per cent. of the money is to be distributed among institutions under Jewish control. Lord Reading is the chairman of the trustees.

POST-VACCINAL ENCEPHALITIS.

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Many different vaccine lymphs have been used to vaccinate the cases which developed encephalitis, and no one source of lymph has been proved to be more associated with the occurrence of the disease than another.

The *geographical distribution* of the cases in each country has been wide.

The cases have chiefly occurred in those regions and at those times when organised vaccination of the population was in progress. Nevertheless, it is noteworthy that, both in the Netherlands and in England and Wales, there have been large populous areas in which vaccination has been carried out on a large scale on persons of all ages during the past four or five years without the occurrence of any post-vaccinal encephalitis. On the other hand, in certain rural districts, sometimes in quite small villages or rural communes, local vaccination has been attended by a relatively excessive proportion of encephalitis cases. Striking illustrations of this circumstance have been supplied in the Dutch reports.

Originally in the Netherlands the local distribution of post-vaccinal encephalitis showed a notable degree of correspondence with the local distribution of known cases of epidemic encephalitis (encephalitis lethargica), but this correspondence has not been maintained in the later series of Dutch cases, and has never been established in any of the English series.

In no country other than the two under discussion has the occurrence of encephalitis been on any considerable scale, but cases of the same sort have been reported in 1922 from Portugal (1); in 1924 from Prague (8), from Switzerland (2), and Germany (3); in 1927 from Poland (2), and the United States (4); and in 1928 from British Guiana (1).

Research has so far failed to give any sufficient or generally accepted explanation of the cause or causes of post-vaccinal encephalitis. The questions whether the appearance of post-vaccinal encephalitis can be checked by the habitual use of smaller doses of vaccine, or by the adoption of different methods of vaccination, are being studied in the countries specially affected. It is hoped, however, that the proposals, in the second part of the report, for international expert coöperation in the study of the different viruses allied to vaccinia; of the effect of diluting vaccine lymph; of the use of antiseptics in lymph preparation, and so forth, may prove to be of use, directly or indirectly, to those who are doing research work on post-vaccinal encephalitis.

Cases in Other Countries.

From the international point of view, it is important that further inquiries should be made as to the existence of post-vaccinal encephalitis in countries other than the Netherlands and England and Wales. If, as it appears, the condition is one which occurs with the utmost rarity among infants vaccinated under the age of two years, and if also it is the fact that post-vaccinal encephalitis is similarly of the utmost rarity after revaccination of older children or adults, it is probable that there are many countries in which little or no post-vaccinal encephalitis is likely to occur. In these countries, the great majority of the population is vaccinated in infancy. But, on the other hand, there are certain countries in which, like the Netherlands, primary vaccination at school age is habitually practised, or in which, as in England, large numbers of children of school age or adults are vaccinated for the first time on account of the appearance of small-pox. It is in such instances that the establishment of the negative, after full inquiry and observation, would be of the greatest value as a control to the English and Dutch experience.

It is fallacious to expect these cases to be brought to the notice of the Central Health Authority merely through the ordinary channels of infectious disease notification. This fact may be attributed either to failure on the part of the practitioner to connect the subsequent illness with previous vaccination, or to the fact that the doctor in attendance on the case during the nervous illness is not the one who performed the vaccination. A further complication in the inquiry is the occurrence of transient cases, or cases with indefinite symptoms, which are readily considered by the practitioner to be due only to vaccination. The four cardinal symptoms of the disease (temperature, vomiting, headache, and drowsiness) may each or all occur in course of normal vaccination in a young child.

The possible fallacies of a negative return from either a country or districts in a country are therefore very great, and a statement that cases of post-vaccinal encephalitis do not occur in a given locality can only be of value if made after most careful inquiry on the spot by a competent investigator, who has access to doctors, hospitals, schools, and all other sources of information in the area. Inquiries are to be made with a view to indicating a limited number of countries or regions which would be appropriate for such investigations.

Conclusions.

The facts and considerations which have been before the Small-pox and Vaccination Commission at its present session seem to permit the following conclusions:—

(*a*) The foremost of these is the rarity of cases of post-vaccinal encephalitis, even in the countries specially affected, by contrast with the number of vaccinations. We are in fact concerned with a minimal proportion of them. (*b*) Apparently the matter is not one in which mere coincidence between vaccination and encephalitis can be invoked; in other words, we are not dealing with a merely fortuitous occurrence. (*c*) In our present state of knowledge we must conclude that post-vaccinal encephalitis is a different disease from encephalitis lethargica. The conditions under which post-vaccinal encephalitis has manifested itself in the Netherlands and in England and Wales tend to show that children between 3 and 13 years of age are particularly susceptible, whilst infancy and adult ages are almost wholly exempt. All observations point to the conclusion that the appearance of encephalitis is not connected either with particular strains of lymph or with particular accidents of lymph preparation. (*d*) Passing to the ætiologico-pathological side of the problem, it would appear in our present state of knowledge that the virus of vaccinia of itself cannot be considered responsible for the supervention of encephalitis. Rather it has to be supposed that some unknown factor exists—perhaps bacterial or a filter-passing virus, or a latent virus—which, by means of a reciprocal reaction, determines the occurrence of the accidents in question.

None of the facts considered in this report lead the Commission to the conclusion that there is reason for discontinuing the use of vaccination, which remains the most powerful weapon against small-pox that we possess.

In view of the circumstances associated with the occurrence of nervous complications which, as explained in the first part of this report, are in any case of extreme rarity, the Commission draws attention to the advantage which may result from practising primary vaccination during early infancy rather than at later ages of childhood.

HALF A MILLION FOR HOSPITALS.—To celebrate his seventy-eighth birthday in December next, Mr. Bernhard Baron, the cigarette manufacturer, has created a trust and endowed it with £575,000 four per cent. Consolidated Loan, to be called "The Bernhard Baron Charitable Trust for Hospitals and Asylums for Orphans and Crippled Children." The trust is to endure for 20 years, and the trustees are to apply annually as nearly as possible an equal proportion of the capital and income to the prescribed purposes. Twenty-five per cent. of the money is to be distributed among institutions under Jewish control. Lord Reading is the chairman of the trustees.

POST-VACCINAL ENCEPHALITIS.

REPORT OF THE LEAGUE OF NATIONS COMMISSION.

AN important session of the Health Organisation of the League of Nations was held at Geneva from August 22nd to 25th. The report[1] of the proceedings has now reached us. Prof. Ricardo Jorge, Director-General of Public Health Services, Lisbon, presided, and those present were:—

Members of the Health Committee: Sir George Buchanan, Senior Medical Officer, Ministry of Health, London; Dr. H. Carrière, Director of the Federal Health Service, Berne; Dr. N. M. Josephus Jitta, President of the Health Council of the Netherlands, The Hague.

Experts: Prof. H. Aldershoff, Director of the State Serological Institute, Utrecht; Dr. F. R. Blaxall, Government Lymph Establishment, London; Prof. M. Camus, Director of the Superior Institute of Vaccine, Academy of Medicine, Paris; Prof. Dr. H. A. Gins, Robert Koch Institute, Berlin; Dr. H. Mervyn Gordon, St. Bartholomew's Hospital and College and Medical Research Council, London; Prof. A. Groth, Landesimpfanstalt, Munich; Prof. G. Sobernheim, Director of the Health Institute of the University, Berne.

The questions considered by the Commission were post-vaccinal encephalitis, and the preparation and preservation of vaccine lymph. The third subject on the agenda was the relationship between the different types of small-pox virus and those of certain human and animal pathogenic viruses, but it was decided to postpone discussion until the problem had been further examined.

A preliminary discussion on *post-vaccinal encephalitis* by a subcommission led to the framing of a report which was adopted by the Commission and is summarised below.

Terminology.—The term "post-vaccinal encephalitis" is used in the report for convenience, without necessarily implying that "post-vaccinal" is considered the equivalent of "propter-vaccinal." Some of the thousands, even millions, of persons who are successfully vaccinated in any given year must fall ill during this period in the ordinary chances of life, and they are no more immune from diseases specially affecting brain and nerves than any other persons. During recent years many countries have experienced a considerable prevalence of epidemic encephalitis (or encephalitis lethargica). The disease has no connexion with vaccination, but it may well be supposed that occasionally persons who have been recently vaccinated would be attacked by it as a matter of chance, like any others. The same consideration applies to chance coincidences between vaccination and attacks of epidemic poliomyelitis. Such rare coincidences, however, do not constitute the "post-vaccinal encephalitis" now under consideration. Encephalitis may occur as a complication of numerous infections, such as measles, or various forms of toxæmia, and it occurs, though rarely, as a complication of small-pox itself. It would be permissible clinically, and perhaps also pathologically, to group all such encephalitis under a single term, encephalitis *post-infectionem*. Vaccination is an infection. It is not implied that post-vaccinal encephalitis is not capable of being classed with, and attributed to, the same ultimate causes as "encephalitis *post-infectionem*," although there are practical reasons for considering it separately and by a separate name at the present time.

Cases in the Netherlands and in England and Wales.

The post-vaccinal encephalitis with which the report deals has become a problem of itself mainly in consequence of the events of the last few years in the Netherlands and England and Wales. In each of these countries the cases which have occurred have been sufficiently numerous and similar to require them to be considered collectively. Their occurrence has led to the realisation that a new, or at least a previously unsuspected or unrecognised, risk attaches to the practice of vaccination. This risk, when taken at its maximum value, is minute in proportion to the vast numbers of normal vaccinations to which the cases of post-vaccinal encephalitis correspond, and it is easy to exaggerate its importance. Nevertheless, it is one whose existence, in these two countries at any rate, has to be recognised, and its meaning considered. In fact, it has in the Netherlands been considered of sufficient gravity to cause the temporary suspension of the administrative measures by which the vaccination of children is secured, while in England the subject has already received the attention of two expert committees appointed by the Ministry of Health, the second of which (the Rolleston Committee) has now presented a comprehensive report,[2] embodying the information and conclusions arrived at by the first or Andrewes Committee, whose work was described to the Health Commission of the League of Nations in 1926.

In the Netherlands, 139 cases of disease of the central nervous system following vaccination were described during 1923 to 1927, of which 41 died. In England and Wales, taking the arbitrary periods dealt with respectively by the Andrewes and Rolleston Committees, 62 cases with 36 deaths occurred between Nov. 14th, 1922, and Nov. 1st, 1923, while a further group of 40 cases occurred between Jan. 1st, 1926, and Sept. 30th, 1927. Of these 40 cases, however, 15 were excluded by the Rolleston Committee on account of their doubtful nature, leaving for consideration 25 cases, of which 12 died, in the second period. The two combined, on this basis, gave a total of 87, of which 48 were fatal, for England and Wales during the two periods under investigation by these Committees.

The clinical characteristics of post-vaccinal encephalitis, as met with in both countries, are quoted from the Rolleston Committee report. Pathologically, the fatal cases have shown diffuse encephalomyelitis, the inflammation being mainly perivascular in type and often accompanied by œdema. The pathological changes in some instances resemble those found in acute disseminated sclerosis, and differ in essential respects from those met with in fatal epidemic encephalitis. The presence of the vaccinia virus in the brain tissue of certain of the fatal cases has also been definitely established. This fact, however, must be considered in the light of modern knowledge regarding the dissemination of this virus after vaccination. The brains were examined at a period after vaccination when it would be anticipated that the brains of many normal vaccinated persons, could they be tested, would equally yield the vaccinia virus.

"*Incubation period.*"—The period which usually elapses between vaccination and the onset of symptoms of encephalitis (the "incubation period") is from 9 to 13 days. The Rolleston Committee found that, out of 125 cases collected from the British and Continental sources, the onset was between the ninth and thirteenth day after vaccination in 94, and the most favoured day was the eleventh.

Age-incidence.—In both countries post-vaccinal encephalitis has occurred more rarely in infants under the age of two years than in older children and in adults.

During the four years 1924 to 1927 in the Netherlands 4 cases occurred among 126,124 vaccinations under the age of two years, as against 130 cases among 462,212 vaccinations between the ages of 3 and 12; in other words, 1 case to every 31,531 vaccinations at ages 0 to 2, and 1 case to every 3555 vaccinations at ages 3 to 12. The vaccination figures are based on the doses of lymph issued and not on the actual vaccinations performed; they are, therefore, an over- rather than an under-statement.

In England and Wales the predilection of the disease for older children has been equally notable, though figures comparable to the Dutch of vaccinations at ages are not obtainable. The vaccinations done by the public vaccinators in England and Wales under the vaccination law of the country are normally limited to the vaccination of infants under two years. But in the English series of 87 cases of post-vaccinal encephalitis referred to above, those under two years of age were only eight in number. During recent years, owing to the prevalence of small-pox, an exceptionally large number of school-children have been vaccinated who had escaped vaccination in infancy, and the

majority of the English post-vaccinal encephalitis cases have occurred among these school-children.

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[1] Publications of the League of Nations. Health. 1928. III. 12. C.H. 739.

[2] See THE LANCET, August 4th, 1928, p. 233.

Method of vaccination: source of lymph.—Most of the post-vaccinal encephalitis cases in both countries have occurred in children whose vaccination, to judge from all ordinary signs and cutaneous reactions, has run a normal course. No single method of vaccinating has been exclusively concerned. The American practice of using minimal quantities of vaccine lymph has, up to the present, been so little followed, however, in the Netherlands or in England that it is not possible to ascertain whether in any case encephalitis has followed the use of this method.

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The cases have chiefly occurred in those regions and at those times when organised vaccination of the population was in progress. Nevertheless, it is noteworthy that, both in the Netherlands and in England and Wales, there have been large populous areas in which vaccination has been carried out on a large scale on persons of all ages during the past four or five years without the occurrence of any post-vaccinal encephalitis. On the other hand, in certain rural districts, sometimes in quite small villages or rural communes, local vaccination has been attended by a relatively excessive proportion of encephalitis cases. Striking illustrations of this circumstance have been supplied in the Dutch reports.

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BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Predestination to Medical Study.

AT the opening of the new home of the Cologne Medical Society, Prof. Moritz read a paper on the qualities which predestine men and women to take up medical work. He agreed with the views of the late Prof. Garré, of Bonn, who discerned two types among mankind—the auditive and the visual. The latter have an open eye for the world of phenomena, whereas those of the auditive type form their views from the written or spoken word. Prof. Moritz said he had written, on the one hand, to nearly all the medical professors at the German universities, and, on the other, to professors of theoretical sciences such as history, philosophy, archæology, and mathematics, asking them to let him know what had been their favourite subjects at school. He wanted to know whether in their matriculation examination they had got high marks in natural science, whether they had shown interest in physical experiments, or whether, as a sign of an auditive disposition, they had easily learnt their lessons by heart. The answers showed that the medical professors when schoolboys belonged rather to the visual type than to the other, whilst the professors of theoretical sciences had an auditive make-up. The medical men had done well in physics and chemistry, and had shown a taste for experiment, collecting, and observation. As only 8 per cent. of the medical men did not belong to that type, Prof. Moritz concluded that the born naturalist and medical man early shows his predilection for visible phenomena and for experiments, and this later helps in his medical training.

Scarlet Fever and the Potato.

A Berlin medical man, Dr. Benda, the author of essays on the influence of weather and social conditions on the incidence of scarlet fever, has now been studying the possible relation between scarlet fever and the consumption of potatoes. The disease first became known, he points out, at the time when the potato was originally imported into Europe—namely, in the middle of the sixteenth century—and it remained very rare until the beginning of the nineteenth century when potatoes began to be consumed in larger quantities. In Prussia at the present day, he finds, 68·6 per cent. of the potatoes come from the six eastern provinces, and only 31·4 per cent. from the western provinces, and he thinks it significant that on the average the eastern provinces have a scarlet fever mortality of 2·56 per 10,000, as compared with 1·14 in the west. In the individual provinces he has noted that good potato harvests coincide with an increase in the mortality from scarlet fever, and he is of opinion that the consumption of this vegetable favours the development of scarlet fever, although other factors, such as the weather and the density and social standing of the population, should not be overlooked. In support of this view he points out that in countries where potatoes are cultivated very little or not at all scarlet fever is very rare, and these facts make him suggest that the virus may be present in the tubers. A similar theory has been elaborated in connexion with certain epidemics which have broken out in barracks, asylums, and other institutions after the consumption of potatoes, and which were originally ascribed to solanin poisoning. They are now regarded in some quarters as possibly due to the presence in the potatoes of the toxins of *Bacillus coli*, *B. proteus*, and other micro-organisms.

Chimney-sweeps' Cancer.

Chimney-sweeps' cancer has completely died out in Germany, according to an article written by the secretary of the Chimney-sweeps' Association. Nevertheless, this disease is still mentioned in recent works on occupational diseases, and is included in the schedule to the recent law on compensation for professional diseases, together with lead, mercury, and other forms of poisoning. The writer is of opinion that the progress of hygiene, especially improvement in washing facilities, has contributed to the disappearance of the disease. In England, he says, chimney-sweeps' cancer still exists, but perhaps this is because the soot from English coal is more irritating to the skin than German soot.

Legal Responsibility for the Mistakes of Locum Tenents.

The question whether a medical practitioner may be held responsible for malpraxis by his locum tenent has lately been decided in the affirmative by the High Court of Leipzig. A medical man had been absent on a holiday and had appointed a locum tenent with a fixed salary on condition that he should attend the patients designated to him by his employer's wife. A patient had telephoned to the doctor's house to say that he had broken his arm, and wanted attention. The defendant's wife answered that he would come at once, but eventually sent the locum tenent. As the treatment given was alleged to have had damaging results, the patient brought an action against the medical man because he had suffered at the hands of his representative. After a long law-suit the High Court found for the plaintiff, on the ground that the locum tenent had acted as the agent of the defendant, and the latter as principal must be held responsible for the mistakes made. The defendant had pleaded that the locum tenent, as a medical man, was completely independent in his treatment, but this argument was not approved by the court.

Scarcity of Bodies for Dissection.

Human bodies destined for anatomical studies are somewhat scarce in certain universities. The laws and regulations on the subject differ in the various German states, but as a rule the bodies of unknown persons and of criminals who have died in penitentiaries are taken to the anatomical institutes. In the case of prisoners this does not happen if the relatives declare themselves ready to pay the expenses of burial. The anatomical institute of the University of Jena has now published an appeal to the public to send bodies for dissection; they say that the corpses are not mutilated, students being instructed to spare the feelings of the relatives. It is pointed out that many great men—for instance, the late Prof. Häckel—have left their bodies to the institute, and there is no reason why other people should not follow their example. The offer is made that where the body is sent for dissection, cremation will be done free of charge, a religious service will be held if desired, and the ashes will be sent to the family.

Periodica Medica.

The Association of the German Medical Press has issued a catalogue of medical journals, reviews, and other periodicals with the abbreviations to be used in citations. This catalogue, which is entitled Periodica Medica, includes the full and abbreviated names of 1800 periodicals, and it will now be enlarged by adding the more important journals of the profession abroad. The work has been carried out by Dr. Kunze, librarian of the former Army Medical College.

Enteric Fever in Potsdam.

An epidemic of enteric fever has broken out in Potsdam and its neighbourhood. By careful investigation it has been ascertained that it started in a milkshop where an employee had suffered from so-called influenza but was eventually found to have had enteric fever. Fifty cases have been reported with three deaths. The milkshop was, of course, closed, and the milkman and the other patients isolated in hospital. The epidemic has since made no progress, and it is hoped that no new cases will occur.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The Dublin Hospitals.

A DISCUSSION concerning the financial condition of the Dublin voluntary hospitals has been carried on in the *Irish Times* during the past week. It began with an unsigned contribution from a correspondent who had made a careful study of the income and expenditure of five of the smaller general hospitals for quinquennial periods before the war and recently. The five hospitals studied have an aggregate of about 600 beds. The total expenditure for the years 1909–13 was £192,000; for the years 1922–26, £367,000. Some of the expenditure was for new buildings or structural alterations, but the correspondent points out that with the advance of medical and surgical technique such changes become frequently necessary, and the expense may properly be classed as ordinary. The annual expenditure has varied little from 1922 to 1926. The income comes from various sources—pay-patients, subscriptions, dividends from invested funds, grants from the Hospital Sunday Fund, the Corporation of Dublin, the Government, and some payments for special services. Some of these sources are discussed in detail. The payments from patients have increased twelvefold from the one quinquennial period to the other. In 1909–13 a sum of £10,315 was collected from patients; in 1922–26 the amount was £120,258. It may be assumed, therefore, that as far as the hospital itself is concerned hospital abuse in the old sense has disappeared. But there is a tendency for a new abuse to appear. This lies in the fact that there is often a difficulty in obtaining a place for a patient who is not able to contribute to the cost of his maintenance.

Paying Patients.

The correspondent next draws attention to the fact that the recognition in the hospitals of a class of pay-patients has led to a change in the relation of the members of the staff to the patients. Formerly members of the staff invariably gave their services gratuitously to all their hospital patients. Now, in some hospitals, it is becoming the custom for members of the staff to accept fees from those who can afford to pay. It is suggested that this custom may lead in time to the disappearance of nursing homes and the concentration of all patients in general hospitals or in homes attached thereto. The amount of money raised in subscriptions increased from £64,000 in 1909–13 to £76,000 in 1922–26. There was, however, a decline in the case of some hospitals, and the increase is in part due to special appeals in recent years. But, as the correspondent drily remarks, "special appeals are among the recognised methods of obtaining hospital funds." The income from investments has increased from £9000 to £10,000: or, in other words, the actual investments have been increased by about £20,000. The combined overdraft of the five hospitals is about £40,000. The correspondent thinks that if this could be wiped out these hospitals could carry on satisfactorily on the present basis, and approximately balance their budgets. In conclusion, he states that there are not more hospital beds in proportion to the population in Dublin than in other centres, and that every hospital has a waiting-list.

A Plea for State Aid.

This communication has been followed by the publication of interviews with several hospital physicians and surgeons. Sir William Taylor puts in a plea for State aid, though he does not desire State control. He suggests that amalgamation of the smaller hospitals would be advantageous to the public, but it would require a capital sum of roughly £700,000. Sir Thomas Myles suggests that the demand on the Dublin hospitals might be considerably lessened if the country hospitals were fitted to do work of a wider range than at present. Nowadays most of the country hospitals have a staff of only one surgeon, so that work must needs be very limited in scope. Mr. Horace Law draws attention to the tax on hospitals constituted by industrial accidents and by the increasing number of motor accidents. He suggests that workmen should contribute to the hospitals through their trade-unions. Sir John Lumsden, while recognising the necessity of accepting payment for maintenance from patients, emphasises the need for making sure that the poor are not excluded. Every voluntary hospital should reserve a number of free beds. Mr. Louis Cassidy suggests the adoption of a scheme of combined marketing, and puts in a plea for provision for research work in the hospitals. Sir William Wheeler thinks that several of the hospital buildings have outlived their usefulness, and are far behind what might be expected in a university city. He urges that children should be removed from the city hospitals to country air.

Medical Certification for National Health Insurance.

Medical certification of insured persons for sickness benefit has had severe criticism at a recent meeting of the Executive Committee of the Approved Societies' Association. Attention was drawn to figures obtained from the National Health Insurance Commission as to the results of the work of the medical referees in the year 1927. It appeared that 13,395 applications had been made to the Commission to provide a second opinion. Of these, 409 were rejected as unsuitably elected and 581 presented final certificates before examination took place. Of the remainder, 4410 failed to attend for examination, about half of them declaring off benefit and the other half ignoring the summons. The remaining 7993 were examined by the medical referees. In regard to 3200 (40 per cent.) the referees found the claimants not incapable of work, while 4793 (60 per cent.) were found incapable and entitled to benefit. The society officials appear to think that these figures disclosed serious laxity in the issue of certificates. Before arriving at such a conclusion it would be necessary to know what proportion these certificates bore to the total number issued. It is wrong to assume that all who declined to attend for examination by the referee did so because they had been acting in fraud. Many sick people will go without benefit rather than take trouble to get it, and many go to work when they should not. That 60 per cent. of the cases thought doubtful by the society officials which actually came to examination by the referee should have been upheld by him is evidence of fairly accurate certification. It was suggested by the secretary of one society that certificates were sometimes issued without examination. If this is done it is liable to the severest professional censure.

Proposed Change of Unit for Distribution of Payment.

While the approved societies are criticising the system of medical certification from one point of view, the National Health Insurance Commission is proposing to make an alteration which is likely to render the system more open to abuse. When the present system was adopted about 13 years ago it was arranged that the dispensary district should be the unit of distribution of payment. A sum equal to the number of insured persons living in the district multiplied by the agreed capitation rate was assigned to each district, and this pool was then distributed according to the work done to the several practitioners who furnished certificates in that district. The Commission now proposes to substitute the county for the dispensary district as the pool unit, on the grounds that the smaller unit leads to widely divergent rates of remuneration, and that the difficulty and expense of obtaining accurate figures of the number of insured persons in the dispensary districts is very great.

Large or Small Units.

It is somewhat surprising that with 13 years' working of the system the Commissioners and the societies have been unable to get a satisfactory register, showing the dispensary district in which each insured person resides, compiled. If such a register were prepared the other objections fall to the ground. The Commission has invited all medical certifiers to agree to the proposed change, but, on the other hand, the chairman and secretaries of the Irish Medical Committee have asked certifiers to take no steps until the local medical committees and the Irish Medical Committee have considered the matter. It has to be recognised that the substitution of a large pool area for a small one abolishes important checks on excessive certification. In a dispensary district pool the great bulk of the pool—probably 80 or 90 per cent.—is likely to go to the dispensary doctor in any event. He is unlikely, therefore, to be tempted to issue certificates in excessive numbers. Moreover, where only a few men share in a pool they act as checks on each other, and it would be difficult for one of them to secure an undue share without rousing the suspicion of the others. In a large area such as a county these checks disappear. An unprincipled certifier, if such there be, has the way open to him to act unfairly by the pool by issuing excessive numbers of certificates.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

Increase of Bastardy.

Dr. Lajos Neményi has been propounding to the Royal Medical Society the question whether the community would not benefit if the same opportunities for development were given to illegitimate children as to those who are born in wedlock. He does not regard the illegitimate birth-rate as any index of the state of morality. This rate has been rising generally in the years since the war, and in Hungary the proportion of illegitimate children in 1925 reached the relatively high figure of 8·2 per cent. Last year nearly 5 per cent. of the pupils at the State auxiliary schools in Budapest were illegitimate. Examination of the patients in the State asylum at Angyalföld shows that general paralysis of the insane is much commoner among women of this class, which is not surprising in view of the inferiority of the education and discipline which they usually receive as girls. Other forms of mental disease do not seem to occur especially often among the illegitimate, and they do not appear to be degenerate by heredity.

Conservative Treatment of Surgical Tuberculosis by Zinc Sulphate.

A preliminary account has been published by Dr. Nikolaus Hedry of his extensive experiments with zinc sulphate in various forms of surgical tuberculosis—e.g., abscesses, caries, fistulæ, and coxitis. After referring to the increase of surgical tuberculosis due to deplorable economic conditions since the war, he goes on to speak of conservative treatment by sunlight, ultra-violet rays, and heat rays. None of these, however, has proved so helpful as zinc sulphate, which he has been experimenting with since the spring of 1926. A 10 per cent. glycerinated solution is employed, and with this it is possible to get complete sterility in abscesses. The infected tissues shrink under the astringent action of zinc, and no harmful incidental effects have been observed in the course of the treatment, apart from a slight inflammation which accompanies the changes in the tissues. In rare cases the patients have complained of shivering and pains, but these were of short duration. Besides many other lesions, six tuberculous fistulæ were treated by irrigation with 1–5 per cent. sulphate of zinc solution, followed by the application of 15–20 per cent. sticks. In three cases the fistulæ were completely closed, and in two there was a considerable improvement; the remaining one showed no benefit. According to Hedry, the particular advantages of the method are as follows. Sulphate of zinc is highly antiseptic, even in high dilution; it is an efficacious astringent, and has a specially stimulating action upon tuberculous tissues, whereby cold abscesses are transformed into warm ones. Its use causes no untoward consequences in the neighbouring healthy areas, even when a strong solution is employed, and no cumulative after-effects have been noted during the two years during which the method has been adopted on a large scale.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

To be Surg.-Lts.: M. A. Graham-Yooll, J. G. Paley, E. W. Graham, R. G. E. Richmond, H. P. Williams, and H. S. Marks.

Surg. Lt.-Comdr. S. R. Johnston to *Caradoc*, for duty during trials.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub.-Lt. D. S. Buchanan to be Surg. Lt.

Proby. Surg. Sub-Lt. T. C. Larkworthy promoted to Proby. Surg. Lt. and appointed to R.N. Hospl., Haslar, for 28 days' training.

Lt.-Comdr. J. H. Anning to *Pangbourne*, for disposal for training.

Proby. Surg. Sub-Lt. J. D. J. Freeman to *Renown*, for training.

ROYAL ARMY MEDICAL CORPS.

Col. N. J. C. Rutherford retires on ret. pay.

Lt.-Col. and Bt. Col. P. H. Henderson to be Col., vice Col. A. Chopping, to ret. pay.

Lt.-Col. B. F. Wingate retires on retd. pay.

The undermentioned Lt.-Cols., having reached the age limit for compulsory retirement, retire on retd. pay: G. J. Houghton (and is granted the rank of Col.), and C. H. Carr.

The undermentioned Majs. to be Lt.-Cols.: G. B. F. Churchill, F. E. Roberts, and E. G. R. Lithgow.

Maj. T. W. O. Sexton, Reg. Army Res. of Off., relinquishes his appt. under Art. 507 (b) Royal Warrant for Pay and Promotion, 1926.

Lt. C. L. Day is restd. to the estabt.

ARMY DENTAL CORPS.

To be Lts. (on prob.): H. L. Foulkes-Roberts, T. R. Wall, J. A. O'Connor, and H. S. Golding.

ARMY RESERVE OF OFFICERS.

Maj. A. F. L. Shields, from R.A.M.C., T.A., to be Maj.

SUPPLEMENTARY RESERVE OF OFFICERS.

Lt. H. L. Oldershaw to be Capt.

TERRITORIAL ARMY.

Lt. A. A. Eagger (late Gordons) to be Lt.

ROYAL AIR FORCE.

Flight Lt. J. Hutchieson is granted a permanent commission in this rank.

RESERVE OF AIR FORCE OFFICERS.

Flying Officer E. D. Gray relinquishes his commission on completion of service.

INDIAN MEDICAL SERVICE.

Col. H. Boulton to be Maj.-Gen.

Lt.-Col. J. Fuller-Good to be Col.

Majs. to be Lt.-Cols.: W. D. Keyworth, B. Gale, H. H. King, R. E. Flowerdew, and A. J. Symes.

Capt. to be Maj.: H. H. Elliot.

Lt. Bhagwant Singh Nat to be Capt. (provl.).

Temp. Capt. Bhanu Datta Sharma relinquishes his tempy. commn.

NORTH PERSIAN FORCES MEMORIAL MEDAL.

Dr. W. H. Dye, Colonial Medical Services, has been awarded the North Persian Forces Memorial Medal for the year 1927 for his paper, The Relative Importance of Man and Beast in Human Trypanosomiasis, published in the Transactions of the Royal Society of Tropical Medicine and Hygiene (1927 vol. xxi). The medal is awarded annually for the paper on tropical medicine or hygiene that has attained a standard of merit published in any journal during the preceding 12 months by a medical officer, of under 12 years' service, of the Royal Navy, Royal Army Medical Corps, Royal Air Force, Indian Medical Service, or of the Colonial Medical Service.

Correspondence.

"Audi alteram partem."

OBTAINING A SPECIMEN OF SPUTUM.

To the Editor of THE LANCET.

SIR,—In his practical and authoritative article last week (p. 614) Dr. S. R. Gloyne states that it is not uncommon for saliva and stomach contents to be sent to the laboratory as sputum. A negative report may under such circumstances be accepted as valid, when a reliable specimen might be found to contain tubercle bacilli. The issues at stake are of such vital importance that I may be permitted to draw attention to some methods that I have employed for the purpose of obtaining a trustworthy sample.

1. *Coaxing* is often effective and may be practised while gently holding the patient's head down over a basin and urging him to "clear his chest and shoot the phlegm out into the basin," while at the same time giving a good cough one's self for him to imitate.

2. *Inhalation of mustard-oil vapour* is of the greatest value. A few drops of the oil in a six-ounce bottle are slightly warmed over a lamp and the patient is asked to have a good sniff or two from the mouth of the bottle. This rarely fails to induce a cough-reflex, especially if there is any inflammatory or tuberculous affection of the larynx. With this I have often obtained a "positive" report when repeated previous ones had been "negative."

3. *Intralaryngeal injection* of a few drops of warm 1 per cent. solution of bicarbonate of soda with a trace of solution of peroxide of hydrogen, as used for cleansing the larynx, may succeed when the mustard inhalation fails.

4. *Trans-nasal instillation* of similar drops may serve the same purpose and requires no "special" technique. The patient sits with his head thrown back and his mouth open. He is instructed to keep on panting and not to swallow while a few drops of the solution are poured into the nose by means of a simple glass syringe. Sufficient is likely to find its way into the larynx to excite a cough and induce free expectoration. This is a method of great value for the introduction of antiseptic oil into the larynx and trachea.

5. *The laryngeal mirror* may serve for the reception of a patch of sputum if the patient coughs while it is in situ.

6. *Potassium iodide*, in small doses, administered for a few days if not otherwise contra-indicated, will often increase the expectoration and bring up the latent bacilli.

It is obviously in the less advanced cases that these methods are called for.

I am, Sir, yours faithfully,

London, Sept. 25th, 1928. JAMES DUNDAS-GRANT.

A CASE RESEMBLING ADDISON'S DISEASE TREATED WITH PITUITARY EXTRACT.

To the Editor of THE LANCET.

SIR,—I can now report the sequel of this case, published in THE LANCET (1928, i., 79). After having derived great apparent benefit from pituitary extract, the patient left this district for South Wales, taking with her a supply of the pituitary tabloids. A fortnight after the supply was exhausted—so I am informed through a relative—she died. I have seen a copy of the death certificate which states "Tuberculosis of the Suprarenal Capsules," not confirmed by autopsy. This is all the information I have been able to obtain, but it appears to confirm the fact that great benefit may be conferred in Addison's disease by administration of pituitary extract.

I am, Sir, yours faithfully,

Merioneth, Sept. 19th, 1928. E. C. B. IBOTSON, M.D.

DEATHS UNDER ANÆSTHETICS FOR DENTAL OPERATIONS.

To the Editor of THE LANCET.

SIR,—Under this heading you called attention last week to an inquiry by the *Dental Surgeon* designed to reduce still further the number of deaths during dental operations. To my mind a lower percentage of deaths in this type of operation must be looked for along the lines of an improved technique on the part of the anæsthetist. If the following three incontrovertible facts are borne in mind it will be seen how large a responsibility rests with the administrator, and how important it is that he should be sufficiently expert to deal adequately with what may prove to be a very difficult administration :—

1. The operation though previously estimated to be of a trivial character and requiring the maintenance of anæsthesia for only a few minutes, frequently devolves itself into a much more arduous affair, requiring a tranquil anæsthetic period of possibly half an hour.

2. In so many cases a partial or even complete obstruction of the upper air passages occurs at some stage of the operation, and in the vast majority this obstruction is brought about by: (*a*) the gradual and increasing collection of blood at the back of the throat; (*b*) the necessary manipulations of the operator's fingers in the mouth pressing back the tongue; (*c*) the extraction of a difficult tooth in the lower jaw, entailing as it so often does undue depression of the chin. The dental surgeon is fully conversant with conditions (*a*), (*b*), and (*c*), and has been rather brought to believe that a "rush policy" answers best—i.e., to continue operating until the last possible moment, knowing from unhappy experience that should he be compelled to desist the chances are extremely remote that more favourable conditions will supervene, as upon his resumption a restless patient may still further increase his difficulties.

3. The method of administration chosen frequently necessitates the reapplication of a closed ether inhaler or the dropping of chloroform on an open mask, owing to the patient's partial return to consciousness. In either case the process of reinduction in an oftentimes restless and cyanotic subject choked with his own blood is fraught with danger, and is to be condemned.

It seems to me, therefore, that the lessening of the anæsthetic risk must be looked for along the lines of a better understanding and firmer handling of the issues involved in the above three factors. With regard to (1) all dental operations in which a general anæsthetic is required should automatically (from the anæsthetist's point of view) be relegated to the same class as other major operations performed upon the mouth and which, by their nature, are likely to give rise to interference with the upper air passages. Only by a frank recognition of this point shall we be able to obtain the same pre-operative routine care and attention in the preparation of the patient as obtains in the other cases under this category. All the well-known arguments cited in favour of preliminary hypodermic medication with morphine and atropine apply with especial force in prolonged anæsthesia for dental operations, and the exhibition of these drugs should be part of the routine treatment.

With regard to (2) and (3) I have employed the following technique with a reasonable freedom from anxiety and with no fatality in well over 1000 cases of multiple extractions: induction by gas-ether or ethyl-chloride-ether sequence with a Clover's inhaler. After induction has been completed, usually in two or three minutes, a further three minutes or so is never wasted in continuing with the closed apparatus, until a condition of "stable anæsthetic equilibrium" has been established. A change-over can now be quickly made to a Shipway's inhaler; the Shipway has been previously connected up with an oxygen cylinder, and the oxygen flow so regulated as to drive over sufficient anæsthetic vapour as previous experience has deemed sufficient to maintain anæsthesia. The narrow efferent rubber tube of the Shipway is wriggled well back to the posterior nares and retained in place by a metal clip attaching it to the ala nasi. Anæsthesia can now be prolonged indefinitely by the judicious administration through the nasal tube of either pure ether, ether-chloroform, or even pure chloroform without altering the uniform flow of oxygen. Cyanosis should rarely take place owing to the relatively large proportion of oxygen passing over; this latter factor enables a temporary obstruction of respiration to occur without any change of colour on the part of the patient. The operator need never be hurried by the thought of the patient's impending return to consciousness, and in consequence is not so reluctant to allow the anæsthetist to keep the operating field reasonably free from blood, with undoubted advantage both to himself and the patient.

One last word: It cannot be too strongly emphasised that no extraction should be continued with in the presence of an even moderate degree of duskiness; all operative interference should be postponed until the normal colour has been restored.

I am, Sir, yours faithfully,

ARTHUR V. BOYALL.

Minehead, Somerset, Sept. 24th, 1928.

THE LATER RESULTS OF PARTIAL GASTRECTOMY FOR GASTRIC AND DUODENAL ULCER.

To the Editor of THE LANCET.

SIR,—Mr. Flint criticises me for saying that "in our experience gastro-enterostomy is the commonest gastric disorder to-day" in view of the fact that I had given figures showing that duodenal ulcer was a still more common condition. But surely duodenal ulcer is a disease of the duodenum and not of the stomach. I have had many cases of gastro-jejunostomy undone in the absence of anastomotic ulcer in order to overcome more or less severe symptoms resulting from the disordered function caused by the operation, which had generally, though not always, been performed for an ulcer. I may add that in several cases the secondary operation was performed by a distinguished Leeds colleague of Mr. Flint.

There is now abundant evidence that duodenal ulcers rarely, if ever, develop in the absence of what I have called the hypersthenic gastric diathesis. This condition is still present after a duodenal ulcer has healed, whether as a result of medical treatment, a gastro-jejunostomy or partial gastrectomy. It is for this reason that none of these measures is likely to lead to *permanent* freedom from symptoms unless the patient follows a suitable régime for the rest of his life. Mr. Lake is asking for trouble if he allows his patients to eat ordinary food, even after six months. That is why I suggested that he would find the last results of his operations very different from what he calls the "late results"—i.e., the results after an interval of only one to five years. I have seen several cases of secondary ulceration after partial gastrectomy and have collected over a hundred from the literature.

Mr. Lake asks what I could suggest as an alternative to gastrectomy for "those cases in acute agony who have already had a succession of medical treatments with almost immediate recurrence." My answer is that there should be no such cases. The acute agony should disappear within 48 hours of beginning treatment, and if this is continued till the ulcer has really healed and not simply until the symptoms have disappeared, if all septic foci are eliminated, and if a proper régime is followed afterwards, the risk of recurrences is small. When they do occur they are far more amenable to treatment than the disasters which may follow gastric operations. Moreover, the mortality is nil, compared with Mr. Lake's mortality of 10 per cent. after partial gastrectomy for ulcer.

It is true that men and women of the labouring class do not come to New Lodge Clinic, but they come to Guy's as often as to Charing Cross. If Mr. Lake will send me his next three cases of the kind to Guy's, I should greatly value the opportunity of demonstrating to him my alternative to partial gastrectomy.

I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, Sept. 24th, 1928.

THE NATURE OF THE ROUS TUMOUR.

To the Editor of THE LANCET.

SIR,—A leading article last week states that "the essential *similarity* between the reaction of the Rous tumour to irradiation and that of true mammalian new growths is evidence in support of the fundamental similarity of these two types of neoplasms." Surely the experiments referred to in this article show some striking *dissimilarities*. Mottram irradiated small Rous tumours in fowls with doses which he calculated would cause their ultimate disappearance. When the tumours had begun to regress, they were removed and dried in vacuo, but when reinoculated into fowls produced tumours. Could any true mammalian new growth have stood such treatment?

Although we gave Rous tumours in vitro five times the dose of X rays lethal to mouse, rat, and human tumours of various types, it had no apparent effect on the subsequent growth; surely this points to some dissimilarity in the Rous tumour. Mottram found that a small nodule of Rous tumour in a fowl could be made to disappear if it was exposed to a certain dose of irradiation, while we found that a dose of X rays lethal to other tumours had apparently no effect on an established Rous tumour in a chicken. Under the conditions of Mottram's experiment the surrounding normal tissues would get a dose of irradiation not very different from the tumour cells; under our conditions they would get only a small fraction of this dose.

In the *British Journal of Radiology* (1927, xxxii, 289) we published experiments showing the deterrent effect which suitable doses of X rays on the skin of the rat had on subsequent tumour-growth, when the tumour cells received no irradiation whatever.

We are, Sir, yours faithfully,

S. RUSS,
G. M. SCOTT.

The Middlesex Hospital, W., Sept. 24th, 1928.

IMPORTATION OF DRUGS AND CHEMICALS.—Under Section 10 (5) of the Finance Act, 1926, the Treasury may by order exempt from the duty imposed by the Safeguarding of Industries Act, 1921, any article which is not made in any part of His Majesty's Dominions in quantities which are substantial having regard to its consumption in the United Kingdom, provided that there is "no reasonable probability that the article will within a reasonable period be made in His Majesty's Dominions in such substantial quantities." The Board of Trade has under consideration the renewal of the exemption which has been accorded to the following substances and articles: R. acetone; acetone (fermentation); synthetic acetone; anhydrous hydrocyanic acid; lactic acid which satisfies the requirements of the British Pharmacopœia; oxalic acid; amidopyrin (pyramidon, dimethyl-amidoantipyrine); ammonium perchlorate; barbitone (veronal; malonal; malourea; diethyl barbituric acid; diethylmalonylurea; hypnogen, deba); bromural (dormigene); crude cocaine; dial (acid diallyl barbituric); didial (ethyl morphine diallyl barbiturate); elbon (cinnamoyl para oxyphenyl urea); ethylene bromide; ethylene glycol (glycol; alcohol ethylene); eukodal; furfurol; glycol ethers; guaiacol carbonate (duotal); hydroquinone; integrators (planimeter type); R. lead acetate; lead tetraethyl; lipoidin; lithium carbonate; lithium hydroxide; metaldehyde; methyl chloride; methyl sulphonal (diethylsulphonemethylethylmethane, trional); nickel hydroxide; papaverine; phenacetin (acetparaphenetidine); phenazone (antipyrine; phenyldimethylpyrazolone; analgesin; anodynine; dimethyl oxychinizin; phytin; piperazine (diethylene-diamine; dispermin); planimeters; R. potassium chlorate; potassium guaiacol sulphonate (thiocol); R. potassium hydroxide (R. potassium caustic; R. potassium hydrate); R. potassium permanganate; pyramidon-veronal; quinine ethyl-carbonate; radium compounds; resorcin (resorcinol); salol (phenyl salicylate); styracol (guaiacol cinnamate); sulphonal; synthalin; urea (carbamide); and vanadium-silica compounds specially prepared for use as catalysts for sulphuric acid manufacture. Any communications with respect to these matters should be addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George-street, London, S.W. 1, before Oct. 18th.

Obituary.

ROBERT KNOX, M.D. EDIN., M.R.C.P. LOND., D.M.R.E. CAMB.

By writing, by organisation, and by example Dr. Robert Knox played an important part in the development of radiology in this country. His death, which occurred in London on Sept. 21st, will be generally regretted by the profession, and especially by those who knew him as a colleague and friend.

DR. KNOX.

Born at Leith in 1868, he received the same name as his father. He was sent to the University of Edinburgh, and graduated there in medicine when 24 years of age. After acting for a time as demonstrator of anatomy in the New School of Medicine at Edinburgh he came south to Guy's Hospital, taking the English conjoint diploma in 1893. A year or two later he settled in general practice at Highgate, but continued his hospital work at the Great Northern Hospital where he first held appointments in the pathological and medical out-patient departments. He began to study radiology within a few years of Rontgen's discovery, and gradually radiological work began to absorb more and more of his time and interest. His first radiological or rather "electrical" appointment was to the Great Northern Hospital, and in 1909 he began his long series of contributions to the literature of the subject. In 1912 he was appointed director of the electrical and radiotherapeutic department of the Cancer Hospital, and began to specialise at Harley-street as a radiologist. In the following year he succeeded Dr. (afterwards Sir) Archibald Reid as radiologist to King's College Hospital. Soon afterwards he followed Dr. F. H. Low as honorary secretary of the Rontgen Society, being also elected to the Council of the Electrotherapeutic Section of the Royal Society of Medicine. Knox was a ready and rapid writer with a good sense of proportion and an eye to effective illustration. His text-book, "Radiography, X Ray Therapeutics, and Radium Therapy," which appeared in 1915 within one cover, was the first comprehensive treatment of the whole subject by a British author. It was an immediate success, which was justified by Dr. Knox's scrupulous care in keeping later editions of the book in touch with every new development. His other literary work included the chapter on Radium Therapy in Eden and Lockyer's Gynæcology and papers in many periodicals, whilst for years past he has been editor of the *British Journal of Radiology* and its predecessor.

His chief radiological researches were done at the Cancer Hospital, Fulham. In the laboratories attached to this department some new device was always being worked at; in radio-diagnosis he was especially interested in developing means whereby accurate information of the heart's movements might be got, and he did a great deal to encourage serial radiography. On the radio-therapeutic side he made a definite attempt to reduce the damage to the skin which may occur when depth doses are administered, and here again by his method of rotational focus a step forward was made. An account of some recent work on the reactions of normal and pathological tissues, carried out in association with the British Empire Cancer Campaign, was given to the Second International Congress of Radiology, held at Stockholm last July.

Dr. Knox helped to found the British Association of Radiology and Physiotherapy, and with Sir Archibald Reid was also the founder of the British Institute of Radiology. He was president of the former and also of the Rontgen Society, and when the Rontgen Society was recently amalgamated with the Institute he was able to give much help to those responsible for the change. Dr. George Batten, who followed Knox as president of the Rontgen Society and the Section of Electrotherapeutics of the Royal Society of Medicine, writes of him that he was a ruling spirit, if not *the* ruling spirit, in these associations. "The Council and members," writes Dr. Batten, "as well as his colleagues at the hospitals, quickly learnt to appreciate Robert Knox for his broadmindedness, thoroughness, and ballast, and we all learnt to love this quiet, modest, efficient man.' He brought to bear on every problem of patient or policy a friendly dignity which produced calm and good results."

Another colleague writes of him that he was always ready to recognise the help received from his staff, members of which, attracted by his personality, often gave their services without payment.

Abroad Knox was probably the best-known British radiologist, and he was elected to honorary membership of several foreign societies, including the American Roentgen Ray and Radium Society. It is not too much to say that it was owing to his initiative that the first International Congress of Radiology was held in London in 1925. During the war he was in charge of the X ray department of the 4th London General Hospital, holding a Territorial commission, and for many years was honorary radiologist to the Queen Alexandra Hospital, Millbank. He had recently been acting in an advisory capacity to the War Office and to the Ministry of Health.

He leaves a widow, Dr. Alice Vance Knox, a daughter, and a son Robert, who is studying medicine at St. Bartholomew's Hospital.

ARCHIBALD DUNBAR WALKER, M.D. EDIN.

We have to announce that Dr. Dunbar Walker, who was for more than 43 years in active practice in the London area, died at his home in Hampstead on Sept. 21st, at the age of 81. His father was a surgeon in the service of the East India Company, and Dr. Walker was born in India. He received his medical education at the University of Edinburgh, where he graduated in 1861 and gained his doctor's degree in 1871. Soon after qualifying he went out to Palestine to undertake medical mission work, spending also some time in Egypt. On his return to this country he took up general practice in Ladbroke-grove, being appointed medical officer to the North Kensington and Kensal-town Provident Dispensary. After 25 years in this district he moved to Notting Hill, where he remained actively at work for another 18 years. Dr. Walker was the author of "Egypt as a Health Resort" and "The Parents' Medical Note Book," besides a number of contributions to the medical press. His sister was Dr. Eliza Walker Dunbar, who long practised in Clifton and died two years ago, and his son is Lieut.-Colonel N. Dunbar Walker, R.A.M.C., another member of the family who sustains its medical tradition.

ALICE DEBORAH HICKLING, M.B.E., L.R.C.P. EDIN.

Mrs. Hickling, who has died at Hong-Kong, was a daughter of the Rev. James Sibree and was born in the Madagascar mission field in 1876. She entered Walthamstow Hall, Sevenoaks, as a young child, and ent up to Oxford in 1894, qualifying from the London School of Medicine for Women in 1901 with the Scottish conjoint diploma. After some two years' experience as resident medical officer at the Sanatorium for Consumption at Clare, in Suffolk, she went out to Hong-Kong to join the staff of the Alice Memorial Maternity Hospital. Shortly afterwards she became Government inspector of midwives in the colony, a post which she held for 20 years. During the war she was medical officer to the Voluntary Aid Detachment in Hong-Kong, and for the last 12 years of her life had been medical officer to the Victoria Nursing Division there. For her services to the colony, in these and other capacities, she was made a Member of the Order of the British Empire, and she was also an honorary serving sister of the Order of St. John of Jerusalem. Dr. Hickling served from 1918 to 1920 as acting medical officer of health for Hong-Kong, and in 1923 was appointed Government assistant medical officer in charge of native hospitals. She married Mr. C. C. Hickling, son of the Rev. James Hickling.

Medical News.

London Medical Exhibition.—From Monday, Oct. 1st, till Friday, Oct. 5th, from noon till 6 P.M., at the Central Hall, Westminster, the London Medical Exhibition will be open to members of the medical profession, and any medical man who has not received a card of admission can obtain one on application to the Secretary, 194–200, Bishopsgate, or at the Central Hall during the exhibition week. This exhibition grows in importance and magnitude every year, and it is expected that the forthcoming display of the latest results of research and of aids to medical and surgical treatment will be the largest yet held. Organised by the management of the Seventeenth International Congress of Medicine, 1913, and of the Fifth Clinical Congress of Surgeons, 1914, it aims at presenting a comprehensive survey of drugs and surgical appliances of practical value to the practitioner, while it also enables him to keep in touch with the latest developments of medical and surgical achievement. A large reception room and a refreshment room with orchestra are provided for the use of visitors.

Royal Sanitary Institute.—The Fortieth Congress and Health Exhibition of the Institute will be held at Sheffield from July 13th to 20th, 1929.

Sir John William Thomson-Walker, F.R.C.S., has been appointed a Deputy-Lieutenant for the County of London.

University of London.—A course of lectures on Smoke Pollution of the Air and Public Health will be given at University College, Gower-street, London, W.C., by Dr. John Owens, at 5.30 P.M., on Nov. 2nd, 9th, and 14th.

University of London Medical Graduates Society.—It is proposed to hold a dinner for members of this society in London towards the end of October, and it is expected that a dinner for members in Birmingham and one for members in Leeds will be held in November. All medical graduates of the University of London are eligible for membership, and nearly 300 life members have so far been enrolled. Applications should be sent to the hon. secretaries of the society at 11, Chandos-street, London, W.1.

Royal Institute of Public Health.—The Harben lectures for 1928 will be delivered at 4 P.M. on Oct. 23rd, 26th, and 30th, in the Lecture Theatre of the Institute, 37, Russell-square, W.C., by Dr. Arthur T. Henderson, lecturer in medicine in McGill University, Montreal, whose subject will be Studies in Asthma and Related Diseases. No tickets of admission will be required. A course of lectures on Industrial Diseases will be held at the Institute in the near future.

German Campaign against Rheumatism.—The third meeting of the Deutsche Gesellschaft für Rheumabekämpfung will be held under the chairmanship of Prof. Dietrich, at Berlin, from Nov. 4th to 7th. The subject of discussion will be the Clinical Features of Rheumatic Diseases, and there will be lecture-demonstrations at various clinics on the relation of these diseases to the different branches of medicine. The address of the society is Fraunhoferstrasse 16, Charlottenburg, Germany.

Medical Research Council: New Offic From Oct. 1st the administrative offices of the M Research Council, hitherto at York-buildings, Ad will be at 38, Old Queen-street, Westminster, London, S. (Telephone, Victoria 5027). The offices of the Indu Fatigue Research Board will also be at the new addr

Large Bequest to Manchester Royal Infirma This hospital has benefited to the amount of £36,000 b a bequest by the late Mr. John Whewell Simpson, Keswick, a director of the Bleachers' Association. Th the largest individual legacy which it has received more than 50 years.

Salisbury Infirmary League.—The members of the Salisbury and District Infirmary and Hospital Le has increased so rapidly that it has been decided to in porate it as a limited company without capital tr without profit. When the League was reorganised in spring of 1922 there were 46 centres of collection and collectors; there are now 280 centres of collection, collectors, and over 50,000 members. In 1914 the Le handed £76 to the infirmary; last year it paid over £

Welsh National Medical School.—We no in The Lancet of July 28th last that students prep for degrees and diplomas other than those given by University of Wales, could not be accepted for cou instruction in the final subjects. Considerable eco hardship is being caused to students in their fourth who might not have taken up the study of medicine they not felt assured that they could pursue it while li at their homes. Moreover, it may not be easy to vacancies at medical schools for students who done their preliminary work elsewhere. The situatio arisen quite independently of the dispute as to the status of the Welsh National Medical School, which is settled in so far that a draft charter establishing it separate school of the University has been adopted by parties concerned and submitted to the Privy Co Unfortunately for the prosperity of the school, how certain members of the staff of the Cardiff Royal Infir have resigned their position as clinical teachers, diminishing the number of beds available for instr to such an extent that the University of London and Conjoint Board have been compelled to withdraw recog of the school as a teaching centre. Joint represent of the case for the students has been made by the p concerned to the Board of the Royal Infirmary with effect. Opposition to the unit system is the alleged c of the resignations.

Medical Diary.

Information to be included in this column should rea in proper form on Tuesday, and cannot appear if it r us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street,

Tuesday, Oct. 2nd.—8.30 P.M., Orthopædics. dential Address, Mr. Naughton Dunn: The S of Muscles and Tendons in Relation to In Paralysis. (To be followed by discussion.)

Wednesday.—5 P.M., History of Medicine. Remar the President, Dr. Herbert Spencer. Paper D'Arcy Power: The Beginnings of the Renais of English Surgery. Members are invited to objects of historical interest for exhibition a meetings of this Section.

Thursday.—8.30 P.M.: Urology. Dr. Oswald Sw Lowsley (New York): Perineal Prostatectomy cinematograph demonstration). Members of th tion of Surgery are specially invited to attend.

LECTURES, ADDRESSES, DEMONSTRATIONS,

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lin Inn-fields, W.C.

Friday, Oct. 19th.—5 P.M., Sir Arthur Keith: Pr in Human Anatomy which arise out of the id cation of a skull attributed to Lord Darnley—D stration, illustrated by specimens.

FELLOWSHIP OF MEDICINE AND POST-GRAD MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, Oct. 1st, to Saturday, Oct. 6th.—BE Royal Hospital, St. George's-fields, S.E. and Sat. at 11 A.M.: Lecture-Demonstrati Psychological Medicine. Royal Free Hos Gray's Inn-road, W.C.—Lecture-Demonstrati Dr. C. B. Heald on Wed., on Treatment by E Therapy, at 5.15 P.M.

T LONDON POST-GRADUATE COLLEGE, West ndon Hospital, Hammersmith, W.

MONDAY, Oct. 1st.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (Demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

TH-EAST LONDON POST-GRADUATE COLLEGE, nce of Wales's General Hospital, Tottenham, N.

MONDAY, Oct. 1st.—2.20 to 5 P.M.: Medical, Surgical, and *Gynæcological Clinics. Operations.*

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

PITAL FOR SICK CHILDREN, Great Ormond-street, .C.

THURSDAY, Oct. 4th.—4 P.M., Dr. Cockayne: Cretinism.

AL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Oct. 2nd.—3.15 P.M.: Sir Thomas Horder: Some Functional Diseases of the Heart and Their Treatment.

TRAL LONDON THROAT, NOSE AND EAR HOSPITAL, y's Inn-road, W.C.

MONDAY, Oct. 1st.—1.30 P.M.: Examination of the Pharynx.

WEDNESDAY, Oct. 3rd.—1.30 P.M.: Examination of the Larynx.

DON SCHOOL OF DERMATOLOGY, St. John's Hospital, Leicester-square, W.C.

THURSDAY, Oct. 4th, at 5 P.M., Dr. J. H. Stowers: Introductory.

T LONDON HOSPITAL FOR CHILDREN, Shadwell, E.

WEDNESDAY, Oct. 3rd.—4 P.M.: Clinical Demonstration. Free to Medical Practitioners.

CHESTER ROYAL INFIRMARY POST-GRADUATE URSE.

TUESDAY, Oct. 2nd.—4.15 P.M., Dr. R. S. Paterson: X Ray Work in Diseases of the Urinary Tract.

FRIDAY.—4.15 P.M., Dr. C. H. Melland: Diagnosis, Prognosis, and Treatment of Pernicious Anæmia.

OATS HOSPITAL POST-GRADUATE LECTURES, l-street, Manchester.

THURSDAY, Oct. 4th.—3.45 P.M., Dr. W. J. S. Reid: Diseases of Sympathetic Nervous System.

Appointments.

MIS. G. R. SEAGER, M.B., B.Chir. Camb., has been appointed Surgeon to the Southampton Borough Police Force.

broke Hospital, S.W.: THOMPSON, JOHN H., M.B. Lond., F.R.C.S. Eng., Resident Medical Officer; MORPHY, P. D., M.C., M.B. Glasg., House Surgeon.

Charlotte's Maternity Hospital: HEGGS, G. B. M., M.R.C.S., L.R.C.P. Lond., Senior Resident Medical Officer; COX, A. RAYMOND, M.R.C.S., L.R.C.P. Lond., Assistant Resident Medical Officer.

ing Surgeons under the Factory and Workshop Acts: WALKER, J. A., M.B., B.S. Lond. (Poole); MILLAR, G., M.B., Ch.B. Edin. (Crook, Durham).

Vacancies.

or further information refer to the advertisement columns.

Hospital for Children, 1, Clapham-road, S.W.—H.S. Also Asst. H.P. Each at rate of £100.

Addenbrooke's Hospital.—H.S. At rate of £130.

Royal Infirmary.—Hon. Asst. Surg. to Ear, Nose and Throat Dept.

Derbyshire Royal Infirmary.—Asst. H.S. and Cas. O. At rate of £150.

Doncaster Royal Infirma

Gloucester, Standish Hous M.O. £250.

Greenwich Metropolitan Borough.—M.O. Welfare Work. £600.

Hampstead, General and North-West London H hill, N.W.—H.S. Also Cas. M.O. and Cas. S at rate of £100.

Hampstead Hospital for Children, College Crescent, N. M.O. At rate of £100.

Hospital for Consumption, &c., Brompton, S.W.—H.P. At rate of £50.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, W.—Res. H.S. At rate of £75.

Ilford Emergency Hospital, Essex.—Jun. H.S. £90.

Jersey General Hospital and Poor-law Infirmary.—Res. M.O. £200.

Lanark, Infectious Diseases Hospital and Tuberculosis Sanatorium, Roadmeetings, Carluke.—Res. Phys. £350.

Leeds City.—Asst. M.O. for Maternity and Child Welfare. £600.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Liverpool, Eye and Ear Infirmary, Myrtle-street.—H.S. £100. Also Hon. Asst. Surgeon to Ear, Nose and Throat Department.

L.C.C. Mental Hospital Service.—Eighth Asst. M.O. £300.

London Temperance Hospital, Hampstead-road, N.W.—Res. M.O. At rate of £175. Cas. O. At rate of £120. Also H.P. At rate of £100.

Macclesfield General Infirmary.—Res. H.S. £180.

Manchester, St. Mary's Hospitals.—Four H.S.'s. Each at rate of £50.

Mauritius, Port Louis.—M.O.H. £900.

Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Sen. Res. M.O. At rate of £140.

Northampton General Hospital.—Asst. H.S. to Ear, Nose and Throat Dept. At rate of £150.

Norwich, Norfolk and Norwich Hospital.—H.S. and Cas. O. Each £120.

Nottingham, General Hospital.—H.P. At rate of £150.

Nuneaton Borough.—Asst. M.O.H. £600.

Paddington Green Children's Hospital, W.—H.S. At rate of £150.

Prince of Wales's General Hospital, Tottenham, N.—H.S., Special H.S., and H.P. Each at rate of £120. Also Jun. H.S. and Jun. H.P. Each at rate of £90.

Queen's Hospital for Children, Hackney-road, E.—Physician-in-Charge Skin Department.

Royal Chest Hospital, City-road, E.C.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.

Royal Free Hospital School of Medicine for Women, W.C.—Res. Asst. Pathologist. £150.

Royal National Orthopædic Hospital, 234, Gt. Portland-street, W. Four Surg. Regs. Each £105.

St. Andrew's Hospital, Dollis-hill, N.W.—Sen. and Jun. Res. M.O.'s. At rate of £150 and £120 respectively.

St. John's Hospital, Lewisham, S.E.—Res. Cas. O. At rate of £100.

St. Mark's Hospital for Cancer, &c., City-road, E.C.—H.S. At rate of £75.

Shanghai Municipal Council, Public Health Dept.—Second Asst. Commissioner of Public Health (Hospitals). £650.

Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. Also Cas. O. At rate of £130 and £120 respectively.

Southern Rhodesia Medical Service.—Govt. M.O. £500 to £600.

Stoke-on-Trent, North Staffordshire Infirmary, Hartshill.—Hon. Asst. Aural Surgeon.

Ventnor, Royal National Hospital for Consumption, &c., Isle of Wight.—Jun. Res. M.O. At rate of £300.

Warrington, County Mental Hospital, Winwick.—Asst. M.O. £350.

Wolverhampton, Wolverhampton and Staffordshire Hospital.—Two Asst. H.S.'s. Each at rate of £125.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Chaddesley Corbett and Halesowen (Worcestershire), Plymstock (Devon), and Hirwain (Glam.).

Births, Marriages, and Deaths.

MARRIAGES.

BINNS—O'SULLIVAN.—On Sept. 19th, at Haverstock-hill, N.W., Raymond Thomas Binns, M.B., B.S., to Anna Mary O'Sullivan.

HALE-WHITE—GOSDEN.—On Sept. 20th, at St. Anne's Church, Eastbourne. Dr. Reginald Hale-White, to Vera, daughter of Mr. and Mrs. John Gosden, of Eastbourne.

MCLAGGAN—ADAMS.—On Sept. 22nd, 1928, at Hampstead, John Douglas McLaggan, F.R.C.S., to Elsa Violet Adams, M.B., B.S.

DEATHS.

BUCHANAN.—On Sept. 23rd, at Westcliff-mansions, Eastbourne, Robert John Bertran Buchanan, late Captain R.A.M.C., aged 48.

KNOX.—Suddenly on Sept. 21st, 1928, in his 61st year, Robert Knox, M.D., C.M., M.R.C.P., M.I.E.E., of 38, Harley-street, and 15, South-grove, Highgate, N.6.

WALKER.—On Sept. 21st, at Maresfield-gardens, N.W., Dr. A. Dunbar Walker, M.D., aged 81.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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MEDICAL PHOTOGRAPHY.

Messrs. KODAK, Ltd., Kingsway, W.C., announce the establishment of a special department for photography, subdivided into the three sections of radiography, clinical photography, and medical and surgical cinematography. A pamphlet, entitled X Ray News, deals with the use of the intensifying screen in radiography, sketching the development of this valuable apparatus. The Rheinberg filters for clinical microscopy, described in some detail, are designed to show the section illuminated in one colour against a background of another. The method is a refinement which should have its use in cases where staining is difficult or unsatisfactory.

ULTRA-VIOLET APPARATUS.

THE MEDICAL SUPPLY ASSOCIATION, Ltd., of 167-Gray's Inn-road, London, W.C., have placed on market under the name of Medisun a small mercury designed as a source of ultra-violet radiation of intensity with a corresponding current consumption. quartz burner is placed in a deep metal hood supported wide aluminium base containing the series resistance, whole instrument being small and portable. The burner made in two forms for use on direct or alternating and since, in the latter case, a special transformer is the price is increased from £10 to £18. The direct instrument consumes about 1 ampère and hence is economical in running costs. The alternating type considerably more current, from 2·5 to 4·5 ampè to the voltage of the supply. Like all mercury arcs, Medisun uses more current on starting up, but not the range of an ordinary house lighting circuit. The of the radiation generated by this small lamp is identical with that of the large quartz mercury arcs.

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